

# POPULAR Computing WEEKLY

Only 40p.

22-28 November 1984

*It's the best selling weekly*

Vol 3 No 47

## Desk-bound

ICL has now launched its QL technology-based One Per Desk executive workstation.

The machine — the first device to incorporate a computer and intelligent telephone terminal in one package — is available in a number of configurations with the base model costing £1188.

One Per Desk (OPD) has been developed from a modified QL and has 128K Ram, 68008 processor, ICL variant of Sinclair SuperBasic, and twin Sinclair Microdrives. It is supplied with either a monochrome or colour monitor. Psion's Xchange suite of software is also available as an option (£150) on a plug-in Rom cartridge.

OPD includes a built-in telephone with conventional handset and software auto-dial directory, capable of storing up

to 500 names and numbers. An integrated, switchable baudrate (300, 600, 1200 or 1200/75) modem provides — with a built-in database directory — single-key access to networks such as Prestel, BT Gold and PSS, as well as Telex facilities.

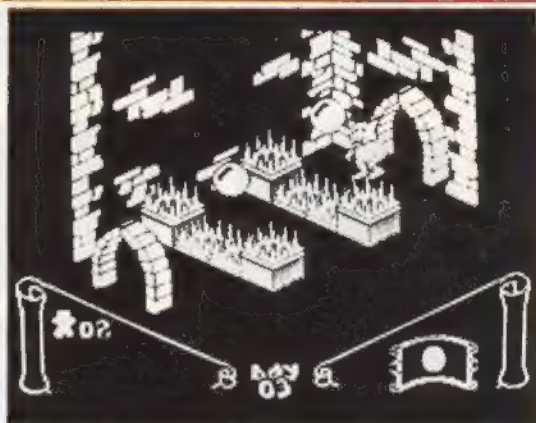
An auto-answer capability is linked to a built-in speech synthesiser to provide preprogrammed replies and a message facility automatically records incoming data. OPD also features a built-in calculator and clock.

One Per Desk will be available in January.

## Oric rights go to Tansoft

HOT on the heels of the announcement by Oric (see *Popular Computing Weekly*, November 15) of three new micros planned for next spring, the company has given sole UK marketing rights of all Oric products — including the Atmos — to Tansoft.

continued on page 59



ULTIMATE's latest game for the Spectrum — *Knight Lore* — features impressive 3D graphics and is available on cassette, priced at £9.95.

## QL No. 2

SINCLAIR is planning to launch a second QL model in the spring of next year.

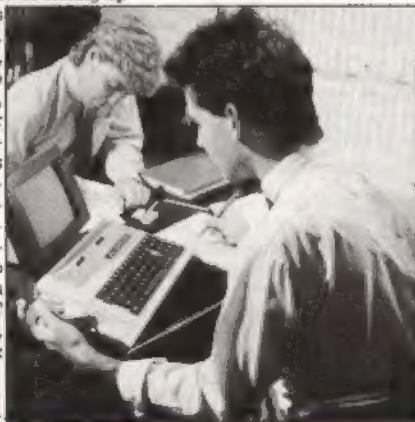
The machine — pitched slightly up-market from the present QL — will differ in that it will have a redesigned circuit board, modified to accommodate Psion's Xchange suite of programs — the more sophisticated versions of the present four QL packages — as a built-in extension of the machine's Rom.

Having the packages built in this way offers a number of advantages. Using the packages is simpler and easier — they no longer need to be loaded from Microdrive and

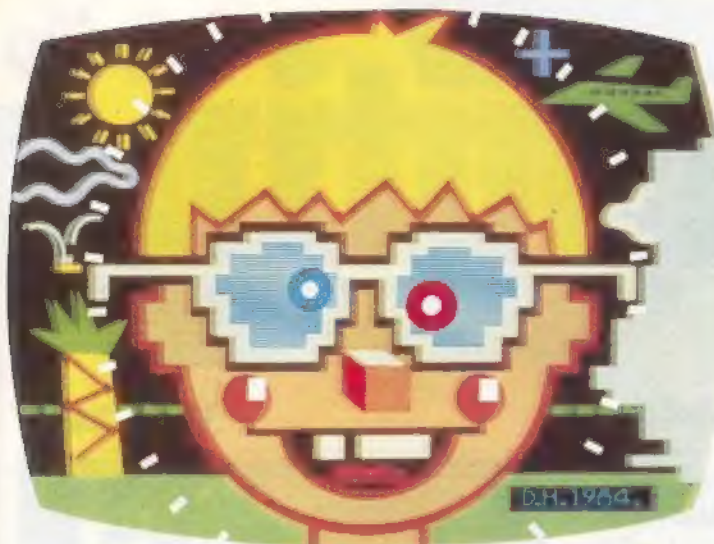
system access to Rom is faster than from Ram. True multitasking is possible and jobs running on any or all of the packages can be run concurrently. The exchange of data between the four packages is quicker. Finally, because the software is provided in five Rom chips (160K in all) the full 128K of Ram is available as work-space.

The Psion Xchange Roms in the new QL model will be very similar to those provided in ICL's new One Per Desk project launched last week (see the separate report, this page). The Rom versions are faster

continued on page 59







# PICTURE YOURSELF ON T.V.

■ We're not the only people who think 'Art Master' and 'Picture Builder' are two quite exceptional computer graphics software programs.

■ Tony and Rolf do, too. Otherwise they'd never have agreed to put their name to them.

■ With both 'Art Master' and 'Picture Builder' you can create full colour pictures on your own T.V. screen.

■ And believe us when we say those pictures will match

the best computer graphics you have ever seen.

■ Anywhere.

■ The pictures are drawn using either the keyboard or a joystick, and can be stored on either tape or on disk.

■ With 'Picture Builder' you are presented with a palette of 121 colour shades (more than enough for any budding Michaelangelo).

■ And a collection of character sets totalling over 250 shapes.

■ So you're hardly stumped for choice.

■ You simply choose your colours and characters, then 'build up' your picture. Just like any other artist.

■ With 'Art Master' you again get a choice of 121 colour shades.

■ But this time you can draw whatever shapes you like, creating your very own high resolution masterpiece from a blank screen.

■ It is even possible to draw circles, and store and then recall a back-up picture -- which is more than you can do with other graphics programs.

■ Everyone, from the six

year old right up to the 66 year old, will enjoy 'Art Master' and 'Picture Builder'.

■ Like all of our software, they have been specifically designed to get the best out of Commodore hardware.

■ That's why you can't choose better.

■ Commodore software: it costs no more, even though there's more to it.

 **commodore**  
COMPUTER SOFTWARE



■ PICTURE BUILDER ON CASSETTE. ART MASTER ON CASSETTE OR DISK. EACH £9.95.

**D**o you ever wonder what happens to the people involved with companies which have crashed spectacularly after they fall from the headlines?

Take Imagine, for example. A substantial sum of money — over £1m — was owed by the company when it folded.

Yet since the company went down in July all of its directors and senior employees have now resurfaced.

Imagine managing director Mark Butler is working for Voyager Software. Bruce Everiss — Imagine's operations director — after a spell doing PR work for Yamaha, has decided to accept a job as managing director of Tanisoft. Ian MacPherson — Imagine's credit control manager — is now occupying a similar post at distributor Microdealer. John Gibson — one of Imagine's top programmers — has formed a new company — Denton Designs — together with eight other former Imagine programmers working on contract work for Beyond and Ocean.

A bizarre twist is the Sinclair connection. After spending a short vacation in the US, Ian Hetherington — Imagine's financial director — has teamed up with Imagine chairman, Dave Lawson in another new company, FireIron, to continue work on the Imagine Megagames for Sinclair. They are now on a reportedly hefty retainer from Sinclair being paid to continue the same programming work started before Imagine went down.

Even the Imagine name is to live on — Beau Jolly will continue to sell the company's back catalogue and Ocean will develop new titles to sell under the Imagine label.

In one sense nothing much seems to have changed.

In the future, though, things may be a little different for directors involved with such companies. The Government is to introduce in this session of parliament its Insolvency Bill aimed at tightening the regulations regarding company failures.

One of the intentions of the bill is to make directors more accountable in the event of a company's failure and, in particular, to prohibit the holding of directorships by individuals with a history of company insolvencies.

## >Presents...

News > Imagine sale > Electron discs

5

Star Game > Arcade action in a two-player game *Porter* for the Spectrum 48K

10

Streetlife > Christina Erskine interfaces with the team at Compunet

14

Software Reviews > See the film...play the game with *Ghostbusters* > Mysterious adventure in *Wrath of Magra*

16

QL Languages > Pascal, BCPL and Lisp for the QL appraised by Adam Denning

20

Competition > Your chance to design a top arcade game... read on!

25

Commodore 64 > If you have the questions, then Dominick Devlin has the answers.

26

Dragon > Part Two of our machine-code scrolling routines by Roger Walton

33

Amstrad > Finish getting organised with Part Two of *Microfile* by Peter Patton

36

BBC & Electron > Baffled by ballistics? Not after *Projectiles* by P Whitehurst

40

Best of the Rest > Letters 7 > Open Forum 44 > Arcade Avenue 44 > Microradio 45 > Baud Wald 46 > Book Ends 49 > Music Box 51 > Adventure Corner 55 > Peek & Poke 57 > Adventure Helpline 65 > Top 10, Diary, Readers Chart 66 > New Releases 67 > This Week 67 > Puzzle, Ziggurat, Hackers 70



## >Futures...

Astrocrash — next week's star game on the Commodore 64...get rid of the bugs in the QL Rom

Editor David Kelly News editor Christina Erskine Features editor Graham Taylor Software editor John Cook Production editor Lynne Constable Editorial secretary Geraldine Smyth Advertisement manager David Lake Assistant advertisement manager Alastair Macintosh Advertisement executive Tom Watson Classified executive Diane Davis Advertising production Lucinda Lee Administration Theresa Lacy Managing editor Duncan Scott Publishing director Jenny Ireland.

Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 295275 Typeset by The Artwork Group, 55-63 Goswell Road, London EC1, in association with Ink on Paper Ltd Printed by East Midland Litho Printers Ltd, Qundle Road, Woodston, Peterborough PE2 9QR Distributed by E M Distribution, London SW9, tel 01-274 6811, telex 261643. © Sunshine Publications Ltd 1984.

ABC

56,952 copies sold every week  
(Jan-June 1984 ABC).

**How to submit articles** Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted. **Accuracy** Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

Computer Trade Association Magazine of the Year



# WILDEST DREAMS

## Software Rental

Just a couple of questions for the computer gamer .....

1. When did you buy your last computer game?
2. How often have you played it?



Buying software can seem a pretty bad deal when you pay £5.99 for only a couple of hours play.

Well, now you can visit the Circus, help King Clive in his dungeon, beat the computer on your Lazer Byke, explore deep space, eat your way through a cheese warehouse and get totally infuriated by the Mazeball, all for less than the price of one new cassette.

How? well, if you go down to your Video dealer today, you're in for a big surprise. He can hire you a Wildest Dream rental cassette for your Spectrum or Commodore 64, featuring one of these games, at a very reasonable price (say about one tenth the price of a good recent game ...)

And its not somebody else's old stock were trying to hire you. These are all brand new games that you've never seen before in the shops - and you won't see them in the shops later.

Only through your local Video dealer can you hire Wildest Dreams rental software.



**CONTACT:- Chris Kilburn**  
**WILDEST DREAMS**  
**P.O. BOX 84,**  
**COVENTRY.**  
**Tel: (0203) 663085**



## Tansoft

◀continued from page 1

Bruce Everiss, ex-Operations Manager of the failed Liverpool-based software company, Imagine, has been selected as managing director of the new-look Tansoft.

"I've always felt that the Atmos was let down by lack of marketing," he commented. "At £130 with a proper keyboard it knocks the socks off the Electron." His appointment as Tansoft managing director follows a recent shake-up at Tansoft which saw the departure of his former chief Paul Kaufmann, and the appointment of Oric managing director Barry Muncaster as Tansoft chairman.

## Moderate turnout at ZX fair

THIS year's Christmas ZX Fair, held last weekend at Alexandra Pavilion attracted moderate crowds but few exhibitors.

By the second day of the show Sinclair was offering a free ZX81 with every QL bought and by the end was knocking £20 off the QL's £399 price.

In contrast — rather surprisingly — the 6809 Show for Dragon and Tandy owners, held over the same weekend, attracted large crowds.

## Adventures for CBM 64

A NEW range of Commodore 64 games based on books by top science-fiction authors like Ray Bradbury and Arthur C Clarke are soon to be available in this country.

The programs have been written by the American software house Trillium which specialises in sophisticated adventures



## Atari price cut in US

ATARI Corporation in the US has announced its intention to further reduce the cost of its 800XL computer by almost a third, from \$179 to \$120 (about £100).

# New Acorn products at Compec

ACORN has announced a number of new products for its BBC and Electron machine's at this year's Compec Show, held last week.

The Plus 3 add-on for the Electron gives the micro a neat 3½-inch single-sided disc drive and interface package, providing 300K of storage. The Plus 3 is available now, price £229. An RS432 communications interface for the Electron is also planned.

For the BBC micro, Acorn launched its Music 500 music synthesiser and optional add-on music keyboard. The

synthesiser itself costs £199. Two languages were on show — ISO Pascal, available now, and Logo available in December. Both are priced at £89.

On the business side Acorn launched a Winchester hard disc unit for the BBC costing £1,499 for a 10M system and £2,299 for a 30M system — both available now. Its long-awaited 32016 32-bit second processor option was also shown. Bundled with five languages — BBC Basic C, Fortran 77, Lisp and Pascal — the whole package costs £899 and will be available in early 1985.



Acorn's Plus 3 add-on

ture games — so-called interactive fiction — based on science-fiction book titles.

The titles include software based on *Rendezvous with Rama* by Arthur C Clarke, *Fahrenheit 451* by Ray Bradbury, *Dragonword* by Preiss and Reaves, *Amazon* by Michael Crichton and *Shadowkeep* by Alan Dean Foster.

All are disc based C64 titles — because of the amount of text and graphics involved — and will retail for £19.95.

The titles are to be distributed in the UK by WHS Distribution, a subsidiary of W H Smith, and will be available from the end of this month.

The price drop has led to speculation that the UK price of £169.99 might also soon be reduced. Commented Atari Corporation UK's managing director Simon Westbrook, "There are no plans at present to reduce the price but I could not rule it out in the future."

## Second QL

◀continued from page 1

and more compact (in memory terms) than the disc-based *Xchange* suites for the IBM PC, Apricot and others because, instead of being written in C, the packages have been hand-coded in machine-code.

The up-market version of the QL is expected to sell for around £500 and Sinclair apparently intends to market it in parallel with the present £399 model.

As for export, it seems likely that Sinclair will concentrate its efforts on the new QL model.

Sinclair may well launch the more expensive QL model in the US in the New Year, in preference to the present version.

## Going, going... still going

THE last remaining assets of Imagine, the failed Liverpool software house, are to be sold off by public tender in December.

The equipment, including 15 Sage microcomputers, portable colour TVs, executive desks, armchairs and typists' chairs, will be on view on December 10 and 11.

Details from the auctioneer's offices, Turner and Son, 28-36 Roscoe Street, Liverpool L1 (051 709 4005).

## Slow start for retailers

MAJOR retail chains, both in the UK and in the US are experiencing a slow start to Christmas hardware sales.

In the US, sales of the Commodore 64 are apparently down between 10 and 30% from last year's figures.

The Commodore 64 accounts for more than 50% of all under \$500 micros in the States. Its only competitors are the Atari 800XL, which has only shown a slight sales rise after a price cut down to \$179, and Coleco's Adam, for which sales have been disappointing.

Although in Britain the marketplace is more competitive, with a greater variety of machines, it seems that here, too, sales are not much up on last year. Peter Frost, of Boots computer buying department, said: "It is still anyone's guess whether the market will develop as it did last year. I don't

think our sales this Christmas will be worse than last year, but they may not be better."

Dave Bryant, sales manager for home computers at Spectrum group, commented: "The trend has certainly slowed down so far this year, but with TV advertising from a number of companies, including Commodore, I think there will be a big surge in December." At W H Smith, George Bradbury added: "The market is taking a while to get going, but it's okay now."

All three commented that the C16 and the Spectrum+ are currently selling well.

Views on MSX machines now reaching the shops were mixed. "It looks as though MSX micros will be few and far between this Christmas," said Dave Bryant. "The Toshiba is selling, but, frankly, not very well," added Peter Frost.



# SHARDS SOFTWARE PRESENTS ... for SPECTRUM 48k

## GALILEE

The long awaited sequel to  
**JERICO ROAD**

*Galilee* is an extensive text adventure with graphics. As the story unfolds you will become entangled in the drama that surrounded the early days of the Christian era.

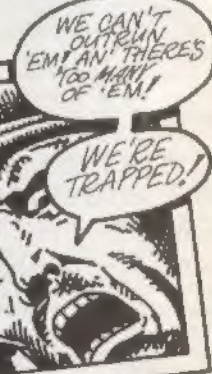
**£5.75**

Written by Peter Goodlad - Author  
of **JERICO ROAD**.



SHARDS

## WORLDS APART



Played on 7 full Graphic  
World Maps

## EMPIRE

THWART THE PLANS OF THE  
EVIL EMPIRE AS IT ATTEMPTS  
TO CONQUER THE WORLD.

**£6.95**

"An extremely good game ... highly  
recommended." *Personal Computer News*

"This is a terrific game ... visually  
attractive and highly addictive."  
*Home Computing Weekly*

**CBM 64**  
Amiga 1000  
Atari 1300 and  
Turbo C64



Selected  
Stores

AVAILABLE NOW AT ALL GOOD STOCKISTS or by MAIL ORDER (send cheque/PO)  
from SHARDS SOFTWARE Roycroft House Linton Road Barking Essex  
OR Telephone through your Access/Visa order to 01-591 7666



## Cry from a Commodore

N Brailsford  
Chesterfield  
Derbyshire

## Watered down Rocky

Having got that off my chest,

Rob Baxter  
50 Milton Grove  
Whalley Range  
Manchester

## Copy comment

Andrew Simmons  
Demon Software  
3 High Street  
Drybrook  
Glos

## Scribble update

```

110 IF (INSTR("0123456789",C1)=0) THEN
111   C1="0123456789" * 100
112 ELSE
113   C1=INSTR("0123456789",C1)
114 END IF
115 C2="0123456789" * 100
116 C3="0123456789" * 100
117 C4="0123456789" * 100
118 C5="0123456789" * 100
119 C6="0123456789" * 100
120 C7="0123456789" * 100
121 C8="0123456789" * 100
122 C9="0123456789" * 100
123 C10="0123456789" * 100
124 C11="0123456789" * 100
125 C12="0123456789" * 100
126 C13="0123456789" * 100
127 C14="0123456789" * 100
128 C15="0123456789" * 100
129 C16="0123456789" * 100
130 C17="0123456789" * 100
131 C18="0123456789" * 100
132 C19="0123456789" * 100
133 C20="0123456789" * 100
134 C21="0123456789" * 100
135 C22="0123456789" * 100
136 C23="0123456789" * 100
137 C24="0123456789" * 100
138 C25="0123456789" * 100
139 C26="0123456789" * 100
140 C27="0123456789" * 100
141 C28="0123456789" * 100
142 C29="0123456789" * 100
143 C30="0123456789" * 100
144 C31="0123456789" * 100
145 C32="0123456789" * 100
146 C33="0123456789" * 100
147 C34="0123456789" * 100
148 C35="0123456789" * 100
149 C36="0123456789" * 100
150 C37="0123456789" * 100
151 C38="0123456789" * 100
152 C39="0123456789" * 100
153 C40="0123456789" * 100
154 C41="0123456789" * 100
155 C42="0123456789" * 100
156 C43="0123456789" * 100
157 C44="0123456789" * 100
158 C45="0123456789" * 100
159 C46="0123456789" * 100
160 C47="0123456789" * 100
161 C48="0123456789" * 100
162 C49="0123456789" * 100
163 C50="0123456789" * 100
164 C51="0123456789" * 100
165 C52="0123456789" * 100
166 C53="0123456789" * 100
167 C54="0123456789" * 100
168 C55="0123456789" * 100
169 C56="0123456789" * 100
170 C57="0123456789" * 100
171 C58="0123456789" * 100
172 C59="0123456789" * 100
173 C60="0123456789" * 100
174 C61="0123456789" * 100
175 C62="0123456789" * 100
176 C63="0123456789" * 100
177 C64="0123456789" * 100
178 C65="0123456789" * 100
179 C66="0123456789" * 100
180 C67="0123456789" * 100
181 C68="0123456789" * 100
182 C69="0123456789" * 100
183 C70="0123456789" * 100
184 C71="0123456789" * 100
185 C72="0123456789" * 100
186 C73="0123456789" * 100
187 C74="0123456789" * 100
188 C75="0123456789" * 100
189 C76="0123456789" * 100
190 C77="0123456789" * 100
191 C78="0123456789" * 100
192 C79="0123456789" * 100
193 C80="0123456789" * 100
194 C81="0123456789" * 100
195 C82="0123456789" * 100
196 C83="0123456789" * 100
197 C84="0123456789" * 100
198 C85="0123456789" * 100
199 C86="0123456789" * 100
200 C87="0123456789" * 100
201 C88="0123456789" * 100
202 C89="0123456789" * 100
203 C90="0123456789" * 100
204 C91="0123456789" * 100
205 C92="0123456789" * 100
206 C93="0123456789" * 100
207 C94="0123456789" * 100
208 C95="0123456789" * 100
209 C96="0123456789" * 100
210 C97="0123456789" * 100
211 C98="0123456789" * 100
212 C99="0123456789" * 100
213 C100="0123456789" * 100
214 C101="0123456789" * 100
215 C102="0123456789" * 100
216 C103="0123456789" * 100
217 C104="0123456789" * 100
218 C105="0123456789" * 100
219 C106="0123456789" * 100
220 C107="0123456789" * 100
221 C108="0123456789" * 100
222 C109="0123456789" * 100
223 C110="0123456789" * 100
224 C111="0123456789" * 100
225 C112="0123456789" * 100
226 C113="0123456789" * 100
227 C114="0123456789" * 100
228 C115="0123456789" * 100
229 C116="0123456789" * 100
230 C117="0123456789" * 100
231 C118="0123456789" * 100
232 C119="0123456789" * 100
233 C120="0123456789" * 100
234 C121="0123456789" * 100
235 C122="0123456789" * 100
236 C123="0123456789" * 100
237 C124="0123456789" * 100
238 C125="0123456789" * 100
239 C126="0123456789" * 100
240 C127="0123456789" * 100
241 C128="0123456789" * 100
242 C129="0123456789" * 100
243 C130="0123456789" * 100
244 C131="0123456789" * 100
245 C132="0123456789" * 100
246 C133="0123456789" * 100
247 C134="0123456789" * 100
248 C135="0123456789" * 100
249 C136="0123456789" * 100
250 C137="0123456789" * 100
251 C138="0123456789" * 100
252 C139="0123456789" * 100
253 C140="0123456789" * 100
254 C141="0123456789" * 100
255 C142="0123456789" * 100
256 C143="0123456789" * 100
257 C144="0123456789" * 100
258 C145="0123456789" * 100
259 C146="0123456789" * 100
260 C147="0123456789" * 100
261 C148="0123456789" * 100
262 C149="0123456789" * 100
263 C150="0123456789" * 100
264 C151="0123456789" * 100
265 C152="0123456789" * 100
266 C153="0123456789" * 100
267 C154="0123456789" * 100
268 C155="0123456789" * 100
269 C156="0123456789" * 100
270 C157="0123456789" * 100
271 C158="0123456789" * 100
272 C159="0123456789" * 100
273 C160="0123456789" * 100
274 C161="0123456789" * 100
275 C162="0123456789" * 100
276 C163="0123456789" * 100
277 C164="0123456789" * 100
278 C165="0123456789" * 100
279 C166="01234
```

**Ian Duerden**  
44 Kelswick Drive  
Nelson  
Lancs

## Quill continued

Before I wrote the utility for



When I wrote the utility, which works with all versions of *Quill* to date, I first used `Input #chan` to access the file, which was very fast, but if a line was encountered which was more than about 120 characters, a buffer error exception occurred. So, I had to make use of `Inkv's (#chan, -1)`. Rumours

Richard Snowden  
Co Durham

## No more jobs

Dawn Charles  
General Studies Tutor  
Central London Youth Project  
99-103 Long Acre  
London WC2

## Win a ZX Spectrum +

There is also a tie-break in case more than one entrant gets the eight program names correct. Read the idea for a new Sinclair game and think up a good title for it: 'As an heir to a vast fortune you have to find and piece together the fragments of a portrait distributed around an isolated mansion.' **The judges decision is final.**

Name \_\_\_\_\_

Address \_\_\_\_\_

1	2	3	4
5	6	7	8

"Fortune" game title \_\_\_\_\_



## First-rate

**Hardware** *Ferguson TX Portable Colour Monitor Television* **Price** £229.95 **Supplier** Thorn EMI Ferguson, Cambridge House, Great Cambridge Road, Enfield, Middx.

**A**fter peering closely at my TV screen for some time to read the script on *Tasword* or having to bring home a heavy monitor to use the school BBC B at home, I decided to give the new Ferguson TX with RGB a trial.

Before using the Spectrum with the set I needed to fit a video output adapter then make up a suitable lead. Adapt Electronics sell a suitable adapter with clear instructions.

Ten minutes to solder up a lead between phono and a 240 degree din plug (the connections are shown on the back of the TV), switch on and plug in with fingers crossed.

Voilà! With a click the screen lights up with a clear image and no background noise (the volume may be left set for TV usage, sound is muted automatically). Trying *Border*, *Paper* and *Ink* on various settings revealed that the colours were clear and bright. The image is generally much sharper than normal.

I tried the new monitor out on a few games. *Jetset Willy* jumps and marches through the sparkling halls of his mansion with a crispness not seen before. On to *Valhalla* and after a little fiddle with the variable capacitors C1, C2, the small figures are sharp and steady and bottles and rings are recognisable. The only fault being green, blue and yellow which when mixed as in the trees still scintillate; well we can't have everything. I shall be reluctant to take this set back to the shop.

Using *Tasword* with a blue paper, white text and magenta border to define the right hand margin clearly, I found I could read text from two yards away.

Trying it now with the BBC, the composite video output only provides a grey scale

picture although admittedly with good resolution and a small border. So back to the bench and make up a RGB lead — a little more tricky this one and Ferguson do list one as an optional extra. Life would be easier if one had been in stock.

However, plug everything in and try ★W., up comes *Wordwise* nice and clear. The top line of Editing mode was half out of sight so escape to menu and type ★TV255 to lower the display, it was much improved. Load a text file, the acid test being what a page of text looks like in preview 80 column mode, Mode 0/3. The result was most pleasing, a clearer image than the standard issue M...V... monitor at school. The resolution must be good.

I next tried a graphics program that draws in Mode 0. A large circle has a slight distortion towards the top but that's being

nit-picking. Lines are finely drawn. Only the brightness control on the TV affects the screen image, colour and contrast have no effect unlike when using the composite video input from the Spectrum. In fact, after churning through a few programs from disc, the colours and screen display, as might be expected from RGB input, cannot be faulted.

Leaving both computers running, the only adjustment needed when switching between RGB and video is to turn the brightness down for RGB and up for video or TV.

In conclusion the Ferguson TX RGB a first rate performance and will not be going back to the shop tomorrow. Anyone want to buy a two year old 14inch colour portable?

David Cole



## Essential item

**Hardware** *Spectrum Video Adapter* **Price** £3.45 **Supplier** Adapt Electronics, 20 Starling Close, Buckhurst Hill, Essex.

**T**his small item is an essential for any person wishing to connect their ZX Spectrum to a monitor that requires a composite video signal.

The adapter arrives in a small poly-bag with an A4 sheet of instructions and two small pieces of insulation tape (1cm square).

It consists of a short length of wire with a Phono socket at one end and two clips attached to red and yellow wires at the other. It is neatly finished.

The step by step fitting instructions are clear and rightly stress the need to take care when opening up your Spectrum to make the necessary connections. No soldering is required. Diagrams are included for issue 2 and issue 3 Spectrums. Fitting takes less than five minutes if you include looking for your screwdriver. The new socket is left hanging out of the back of the Spectrum case next to the EAR socket. A little untidy, I was able to improve the fitting with more space available in my Fuller Keyboard case.

If the monitor has a TV type socket then

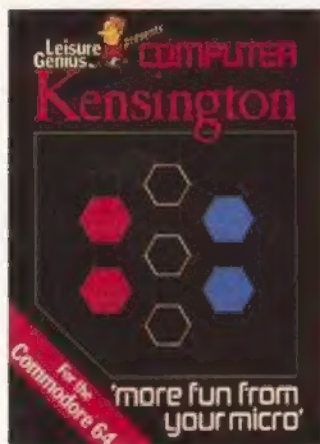
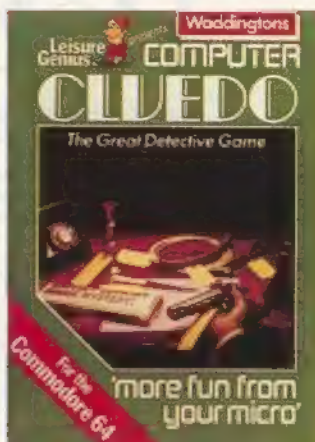
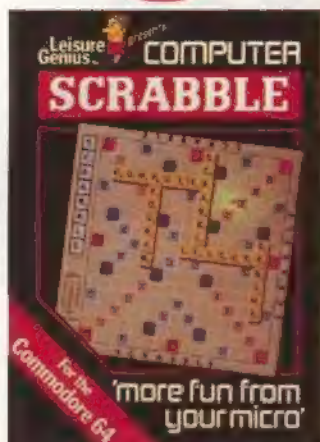
you may connect up with the standard Spectrum lead, but connecting to the monitor will require another lead for the composite video input. These are available from Adapt Electronics (£3.50 — £4.00).

We first tried the adapter with a BBC 12 inch green-screen monitor *Tasword's* 64 character screen could be zoomed to fill the monitor screen and the clarity was improved by *Pokeing* the *Paper* and *Ink* colours to black and white respectively (instructions to do this are available from *Tasword*). The resulting display was professional, and after two hours of letter writing and file manipulating with masterfile, eye strain was definitely reduced. A useful purchase.

David Cole



# Ingenious...



## Computer games for people who hate computer games.

Give your joystick a rest, and your brain a chance with these family favourites.

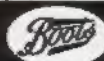
Software by...

**Leisure Genius**

3 Montagu Row, London W1H 1AB



NOW AVAILABLE AT



WHSMITH

AND AT OTHER LEADING STORES.

SCRABBLE® trade mark and copyright licensed by Scrabble Schutrechtliche und Handels GmbH (a J. W. Spear & Sons PLC associated company).  
CLUEDO® trade mark and copyright licensed by Waddingtons Games Ltd. MASTERMIND® trade mark and copyright licensed by Inventa Plastics Ltd.  
KENSINGTON® trade mark and copyright licensed by White Toys Ltd. LEISURE GENIUS® is a registered trade mark of Winchester Holdings Ltd.



# Porter

It was never like this at the Hilton in Porter on the Spectrum 48K by Stephen Fisk

**F**ew two-player games in which both players are active at the same time have been designed for the Spectrum (with one or two notable exceptions), despite their advantage of generating greater variety. In any game played against the computer the strategy of the machine, however complex, is of course predetermined and will gradually be learnt by the player. Against human opposition, on the other hand, a player will meet a wide range of different strategies. Different opponents will tend to play in, say, an aggressive or defensive fashion, and even a single opponent can be expected to use different strategies at different times.

In *Porter* each player controls a porter who can attempt to shoot the other porter

and also has the task of carrying suitcases from one side of the screen to the other. The suitcases for the blue porter start on the left and have to be carried across to the right; and vice versa for the red porter. In order to pick up a suitcase the porter must be located directly above it.

Each player in the game has three lives, and the game ends when one player has lost all three lives. The winner is the player with the higher score at that moment.

You shoot in the direction in which you are facing, and shots have a limited range. If you hit a porter who is carrying a suitcase, the suitcase as well as the porter will disappear. For this reason, if you expect to be shot it is often wise to drop any suitcase immediately; it will at least be possible for

the succeeding porter to retrieve it.

Hitting the opponent scores three points, shooting, but missing is minus one point. Dropping a suitcase after carrying it across the screen scores the number of points displayed on the suitcase.

The controls are as follows:

	Blue	Red
Up	3	8
Down	S	J
Right	E	I
Left	W	U
Pick up	Z	Symbol shift
Drop	X	M
Fire	C	N





22-28 NOVEMBER 1984



# BACKPACKERS

## GUIDE TO THE UNIVERSE PART 1

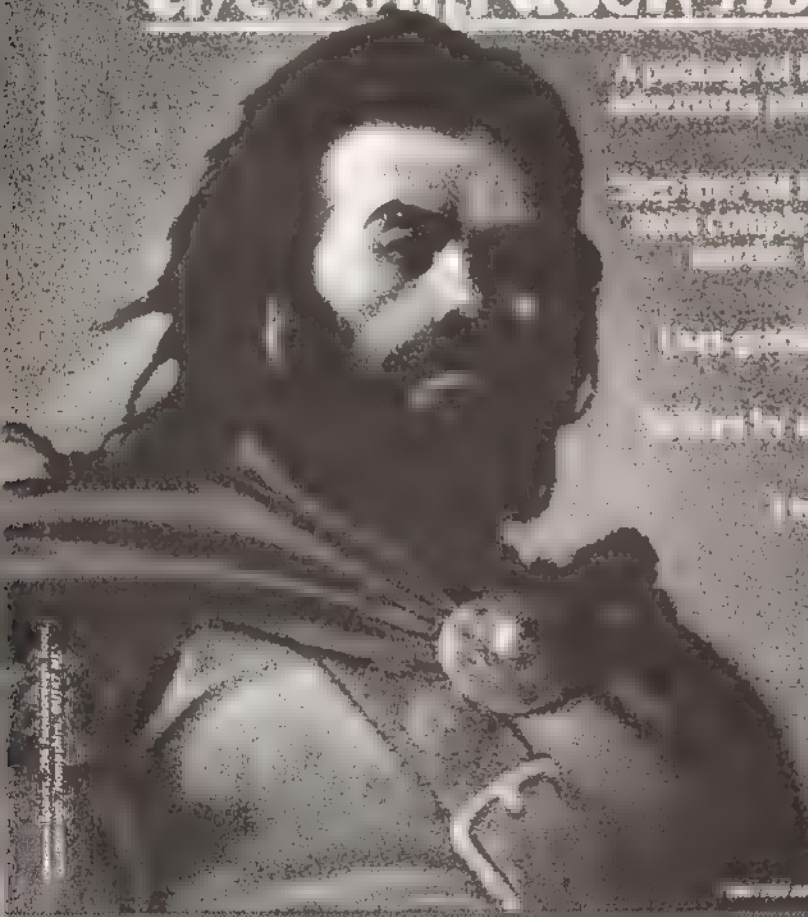
Not just a game...  
...more a way of life

48K Spectrum  
£7.50

Software by **fantasy**

# MACBETH

## THE COMPUTER ADVENTURE



Macbeth is a computer adventure game for the Commodore 64. It is a story of a man who becomes a king, and then a tyrant. It is a game of strategy and tactics, and it is a game of survival. It is a game of power and ambition, and it is a game of greed and lust. It is a game of love and hate, and it is a game of life and death. It is a game of fate and destiny, and it is a game of chance and luck. It is a game of skill and cunning, and it is a game of wit and wisdom. It is a game of courage and bravery, and it is a game of strength and power. It is a game of honor and glory, and it is a game of fame and fortune. It is a game of wealth and riches, and it is a game of power and influence. It is a game of control and domination, and it is a game of mastery and expertise. It is a game of knowledge and understanding, and it is a game of insight and perception. It is a game of intuition and instinct, and it is a game of feeling and emotion. It is a game of passion and desire, and it is a game of love and affection. It is a game of friendship and loyalty, and it is a game of trust and faith. It is a game of hope and optimism, and it is a game of faith and belief. It is a game of courage and bravery, and it is a game of strength and power. It is a game of honor and glory, and it is a game of fame and fortune. It is a game of wealth and riches, and it is a game of power and influence. It is a game of control and domination, and it is a game of mastery and expertise. It is a game of knowledge and understanding, and it is a game of insight and perception. It is a game of intuition and instinct, and it is a game of feeling and emotion. It is a game of passion and desire, and it is a game of love and affection. It is a game of friendship and loyalty, and it is a game of trust and faith. It is a game of hope and optimism, and it is a game of faith and belief.

Macbeth is a computer adventure game for the Commodore 64. It is a story of a man who becomes a king, and then a tyrant. It is a game of strategy and tactics, and it is a game of survival. It is a game of power and ambition, and it is a game of greed and lust. It is a game of love and hate, and it is a game of life and death. It is a game of fate and destiny, and it is a game of chance and luck. It is a game of skill and cunning, and it is a game of wit and wisdom. It is a game of courage and bravery, and it is a game of strength and power. It is a game of honor and glory, and it is a game of fame and fortune. It is a game of wealth and riches, and it is a game of power and influence. It is a game of control and domination, and it is a game of mastery and expertise. It is a game of knowledge and understanding, and it is a game of insight and perception. It is a game of intuition and instinct, and it is a game of feeling and emotion. It is a game of passion and desire, and it is a game of love and affection. It is a game of friendship and loyalty, and it is a game of trust and faith. It is a game of hope and optimism, and it is a game of faith and belief.

Macbeth is a computer adventure game for the Commodore 64. It is a story of a man who becomes a king, and then a tyrant. It is a game of strategy and tactics, and it is a game of survival. It is a game of power and ambition, and it is a game of greed and lust. It is a game of love and hate, and it is a game of life and death. It is a game of fate and destiny, and it is a game of chance and luck. It is a game of skill and cunning, and it is a game of wit and wisdom. It is a game of courage and bravery, and it is a game of strength and power. It is a game of honor and glory, and it is a game of fame and fortune. It is a game of wealth and riches, and it is a game of power and influence. It is a game of control and domination, and it is a game of mastery and expertise. It is a game of knowledge and understanding, and it is a game of insight and perception. It is a game of intuition and instinct, and it is a game of feeling and emotion. It is a game of passion and desire, and it is a game of love and affection. It is a game of friendship and loyalty, and it is a game of trust and faith. It is a game of hope and optimism, and it is a game of faith and belief.

Macbeth is a computer adventure game for the Commodore 64. It is a story of a man who becomes a king, and then a tyrant. It is a game of strategy and tactics, and it is a game of survival. It is a game of power and ambition, and it is a game of greed and lust. It is a game of love and hate, and it is a game of life and death. It is a game of fate and destiny, and it is a game of chance and luck. It is a game of skill and cunning, and it is a game of wit and wisdom. It is a game of courage and bravery, and it is a game of strength and power. It is a game of honor and glory, and it is a game of fame and fortune. It is a game of wealth and riches, and it is a game of power and influence. It is a game of control and domination, and it is a game of mastery and expertise. It is a game of knowledge and understanding, and it is a game of insight and perception. It is a game of intuition and instinct, and it is a game of feeling and emotion. It is a game of passion and desire, and it is a game of love and affection. It is a game of friendship and loyalty, and it is a game of trust and faith. It is a game of hope and optimism, and it is a game of faith and belief.

Macbeth is a computer adventure game for the Commodore 64. It is a story of a man who becomes a king, and then a tyrant. It is a game of strategy and tactics, and it is a game of survival. It is a game of power and ambition, and it is a game of greed and lust. It is a game of love and hate, and it is a game of life and death. It is a game of fate and destiny, and it is a game of chance and luck. It is a game of skill and cunning, and it is a game of wit and wisdom. It is a game of courage and bravery, and it is a game of strength and power. It is a game of honor and glory, and it is a game of fame and fortune. It is a game of wealth and riches, and it is a game of power and influence. It is a game of control and domination, and it is a game of mastery and expertise. It is a game of knowledge and understanding, and it is a game of insight and perception. It is a game of intuition and instinct, and it is a game of feeling and emotion. It is a game of passion and desire, and it is a game of love and affection. It is a game of friendship and loyalty, and it is a game of trust and faith. It is a game of hope and optimism, and it is a game of faith and belief.

FOR COMMODORE 64  
£14.95

CREATIVE SPARKS

Available from  
All good computer software stockists.

Send me (tick as required)

- ☐ My local stockist's address  
☐ Your full list of games  
☐ \_\_\_\_\_ copy/ies of this game

TNEE 293 at £14.95 each    £    :    :    :  
+ single P&P sum    :    :    30p  
Total to send    £    :    :    p

Method of payment  
By cheque or PO (no cash) made payable  
to TECS



- ☐ By Access or  
☐ Barclaycard

Enter card no.

\_\_\_\_\_

Sign below:

Credit card sales, UK buyers only  
Response within 21 days.

Creative Sparks,  
Department M0,  
296 Farnborough Road,  
Farnborough, Hampshire, GU14 7NF.  
Telephone: (0252) 518364.

Name \_\_\_\_\_

Address \_\_\_\_\_



## Voices in the wilderness

*Christina Erskine walks in The Jungle and tramples through MUD... all without getting her feet wet*

**A**lan Carmichael, head of Compunet Teleservices, reckons Compunet is one of the first truly interactive databases.

What he means by this is that on Compunet there is plenty of scope for talking to other Compunet users, whether through the user's software 'market', The Jungle, or playing Multi User Dungeon with up to 100 others.

I went to talk to Alan, and Graham Craigie, general manager of Compunet Teleservices, at the company's newly acquired premises in the centre of London.

Compunet was originally set up as a joint venture between Commodore and ADP Network Services, to provide a network database specifically for Commodore 64 owners. Both Alan and Graham were formerly at ADP, and involved with Compunet's development from the very beginning.

"ADP decided on a major strategy review earlier this year, saying it would only continue investment in three areas — and Compunet wasn't one of them!" explained Alan. "Graham and myself left the company to form Reactive Technology, and carry on the commitment to develop the system."

"While ADP still supplies the network itself which Compunet runs on, it is no longer involved in ownership. Compunet is now a separate company owned jointly by Commodore and Reactive Technology."

The interaction between users particularly convinced Alan and Graham that Compunet was viable. "We felt, and still do feel, that people don't just want to retrieve information from the big databases. We wanted 64 owners to be able to participate more. They should be largely deciding what goes into it."

Hence The Jungle, a section of Compunet, where, says Alan, "users are pretty much allowed to do what they want". The jungle gives members the facility to up- or down-load software, insert small ads — the most interesting small ad I saw was a QL for sale — leave messages — as on a bulletin board — and write comments, complimentary or otherwise, about software on offer from other jungle users. While on other sections of the network, a fixed price is charged by Compunet for taking advantage of the facilities, in the jungle, software providers can charge their own price for their efforts.

"Obviously, with something uncontrolled like this, some people may abuse the system and users are free to make complaints. If we come across anything really dreadful, like piracy or obscenity, then we can cut off someone's account."

Compunet is designed to be as inexpen-

sive as possible for the user. The first year's subscription is free, and membership arrives automatically with the purchase of the Commodore Communications Modem at £89.95. "What has actually happened is that Commodore is paying us the £30 for each person which is the yearly subscription. Calling up Compunet during off-peak phone times — after 6pm and all weekend — is also free, apart from the British Telecom phone charge of course. Users will only have to start paying Compunet when using the facilities — there is no charge for just flicking through the pages and seeing what's on offer."

Subscribers to Compunet have an account opened for them. Every time they "buy" anything, the cost is automatically recorded and the subscriber is billed accordingly.

The Edit facility, which comes as part of the modem software enables pages to be compiled while off-line, before being input into Compunet on-line, thus saving money and it also allows the user to store pages on-line, and then browse through them at leisure later, off-line.

Using Compunet has been made as easy as possible too with a 'duck shoot' style menu permanently travelling along the bottom of the screen, containing all the necessary commands: "Up-load", "down-load", "buy" and so on.

How many Commodore owners are going to get deeply involved in using Compunet? Neither Prestel nor Micronet have attracted as many subscribers as originally hoped (Micronet has only around 15,000 subscribers).

"I think networking is set for a big boost in the next year," said Alan. "We do feel it is going to appeal to a fairly small regular user base, but with the modems themselves, a price barrier has now been broken. Three months or so ago, modems were costing £160 to £170. Ours, at just under £100, comes with all the software necessary to plug in and get going straightaway."

"Initially, we think Compunet will appeal to the keen enthusiasts, the buffs and hackers that will account for our first 5-6000 users. But after that, as it develops, we want the network to provide interest to the whole family."

At the moment, Compunet is still in the process of developing and finalising many of the services available. Currently up and running is Commodore's own Vicsoft library of education programs in the section entitled *The Study* — most of which are free to down-load.

"There are about 60 different programs available at the moment covering subjects



from Maths to Health Education," said Alan. "We're planning to add about ten new titles each month to the list. The library of educational programs is a prized possession of Commodore's — it was put together in Canada in the days when the Pet was the leading education machine, and a lot of the programs have since been converted for the 64."

A more controlled — and controllable — version of The Jungle, Software Park, is administered by Compunet. This section comprises commercial programs, which cost money for the user to down-load. Mr Micro is just one of the companies which has sent programs to Compunet to be sold in this way.

Most of the programs in Software Park are protected, in that the user's modem number is encoded into the program when it down-loads.

Then there is Compucat, Compunet's resident journalist, keeping all users abreast of events in a highly personal, chatty style.

Also on the go, is MUD, the Multi User Dungeon — at present the showpiece of Compunet. This Dungeons and Dragons style adventure was set up and developed largely by Richard Bartle for students at Essex University. Its implementation on Compunet is the first time a true multi-user adventure has been easily available to the public. "It seems to be taking off quite well, too," said Graham. "I logged in about three days after it was first available, and already there were six others in the game."

"There's lots more to come on the system," said Alan. "The home banking service will be announced this month — this



Ian Cartmichael (right) and Graham Craigie of Compunet Teleservices

will be very much consumer orientated, with advice on how to get loans, what sort of insurance people need and so on.

"The idea is to introduce something new each month. For instance, next month a computer magazine — no, I can't tell you which one — is going to become available on Compunet as well as appearing conventionally in print."

The estate agency service, vaunted in Compunet's pre-publicity releases, is on Compunet, but not yet available to public users, though it will be within the next few months.

"National Property Link do a computer networking service for estate agents and offered to do this via Compunet. At the moment it is marketing direct to the agents, but it will be thrown open to the public in the not-too-distant future."

Also, tucked away in a corner of Compunet is an interesting page, which gives explicit instructions for accessing Prestel through the Commodore modem.

Isn't this a somewhat self-defeating exercise? "Not at all. If people want to access Prestel, then they're going to find out how to access Prestel, whether we tell them how or not. Several Compunet users have accounts with both networks, anyway, so I don't see that we should see them as rivals. "Compunet's better."

## FAST LOADERS

## COMMODORE 64

## TAPE TO DISK

### R.B.S.

A NEW GENERATION conversion utility, developed from the acclaimed Hypersave-64, R.B.S. converts virtually all your long loading cassette programs to TURBO-LOAD, faster than the CBM disk drive. Multi-part and autorun programs are handled with ease. Converted programs load independently. No additional hardware, no pokes, no SYS calls, no user knowledge required. Load "The Hobbit" in 120 seconds. Tornado, Lightning load, Fastback now obsolete. R.B.S. will convert more programs than any competing utility. Cassette £7.50p.

### HYPERSAVE-64

Retaining the flexibility which the programmer demands, Hypersave leaves you in control. ■ additional Basic commands. Save, load, verify up to 48K continuous Ram ■ HYPER SPEED with full error checking. Converted programs reload independently. Autorun facility. Hypersave also allows a small number of fast loading programs to be converted to Hyperload. Reviewed in Your 64 issue ■. Cassette £7.50p.

### DISKUS I

Introducing the new market leader. This is the simplest ■ use and most efficient tape to disk transfer utility yet devised. No program rewriting is required and transferred programs will automatically run when loaded.

- ★ For single, multi, and autorun programs
- ★ Automatic filename handling
- ★ Efficient use ■ Disk space
- ★ No user knowledge required

Diskus 1 will handle several program types which other utilities ignore, including headerless files. A bonus program is included which will transfer a number of fast loading programs to disk. Cassette £9.99p.

### PRO-SPRITE

Library, Editor, Animator for single and multicolour sprites. Joystick control. Packed with features. Menu driven. 100% machine code. Complete with your first sprite library. Cassette £7.50p

**FREE WITH EVERY ORDER:**  
**SECRETS! A GUIDE TO CASSETTE I/O CONTAINING**  
**PREVIOUSLY UNPUBLISHED SECRET**  
**INFORMATION. FAST DESPATCH GUARANTEED.**  
**CHEQUE/P.O. OR SAE TO:**

**DOSOFT**  
**2 Oakmoor Avenue**  
**Blackpool FY2 0EE**

**DISKUS I IS £9.99 SPECIAL DISCOUNT:**  
**ANY TWO OF THE REMAINDER JUST £9.99p.**  
**ALL THREE ONLY £15.00p.**  
**ALL PROGRAMS SUPPLIED WITH FULL**  
**INSTRUCTIONS AND MAY BE TRANSFERRED TO**  
**DISK.**



## Me? Who?

**Program Know Your Own Personality Micro** Spectrum 48K Price £9.95 Supplier Mirrorsoft, Holborn Circus, London EC1

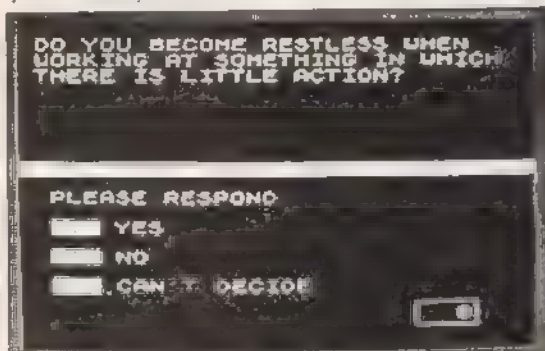
**D**ear Clare Nobody likes me. Even my Spectrum crashes when I approach. What should I do? — Worried.

Dear Worried — Could it be that you have a personality problem? In this case I have a computer program, based on a best selling paperback by Professor Hans Eysenk and Dr questions about your views and

behaviour — 630 to be exact, divided into three groups, so it all takes time and there's lots of data reading. Then, in less time than it takes to spell psychoanalysis, it produces a bar chart and written comments that define your characteristics.

But, Worried, you ask me if this is scientifically sound. The accompanying booklet makes certain initial high sounding claims, but lest you worry too much when you find it says that you should be locked away. I would suggest that there are too many variables involved.

An unusual addition to any self-seeking Habitat household, but when you really need help the micro will never re-



Glenn Wilson, to help you 'know yourself'.

It asks you multiple choice

place us agony aunts.

John Minson

## Also ran

**Program Sports Hero Micro** Spectrum 48K Price £6.95 Supplier Melbourne House, Castlefield House, Caslefield, Richmond, Surrey

**S**omebody ought to tell Melbourne House that the Olympics have finished Sports Hero — so obviously a game released a few months late. If you've played *Athlete*, then you will find little new in *Sports Hero*. There are good animated graphics and smooth running action as you attempt to qualify for the finals of the four events: 100 metre sprint,

110 metre hurdles, long jump and pole vault. Unfortunately, the finals never happened, so the best you can do is 'qualify'. The blurb on the cassette box is all too honest, 'Here's your chance to be part of a winning team.'

As in *Track & Field*, you achieve speed by pressing two keys in quick succession: the faster you press, the quicker the athlete runs.

The hurdles and pole vault are quite difficult — it's hard to judge when to make the jump to clear the hurdles and the pole is easy to break, with dire consequences, when vaulting. There are three levels of difficulty, each with its own detailed background graphics.

Different, and certainly appealing to armchair athletes, but I don't think the AAA will be too worried just yet.

Simon Springett



## Pot shot

**Program Potty Pigeon Micro** Spectrum 48K Price £5.95 Supplier Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield

**W**hat are pigeons best known for? That's right — gathering worms to feed their young. That's your mission as Percy, the *Potty Pigeon*.

Your air space is as crowded as fog-bound Heathrow though, and the worms appear in the most inconvenient places, such as roads, so it's easy to become a late pigeon.

Now what else are pigeons known for? Laying eggs... at least I think they're eggs! Whatever, they serve as bombs to dispose of your opponents.

So long as you remember to rest your wings regularly you are ready to fly the world's first pigeon flight simulator.

Like many multi-screen



games thus requires careful timing and fast reactions. Perhaps less strategy than usual is called for, but at least Gremlin have disposed of the platform element that is so common nowadays. In fact, *Potty Pigeon* is a joy graphically, humorously and is smoothly animated and highly detailed.

Sad to report that the keyboard control is not good, owing to an odd selection of keys and a joystick is necessary. I also wonder about its lasting addictiveness — it lacks the puzzles of arcade adventures.

John Minson

## Take two

**Program Wrath of Magra Micro** Spectrum 48K Price £12.50 Supplier Mastervision, Park Lorne, 111 Park Road, London NW8

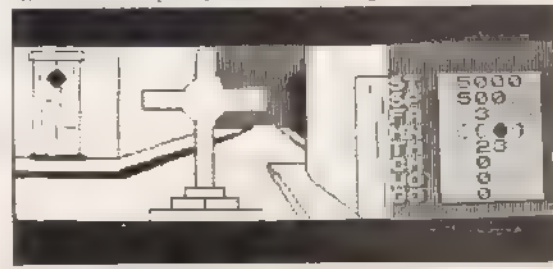
**W**rath of Magra is the third of the Third Continent series of games, originally released by Camell Software, and now put out in an improved, speeded-up form by Mastervision under the Mastervision label.

The price may seem steep, but it's well worth it — you get three games, detailed instructions, and a 158 page tome, *The Book of Shadows*, which gives you the history behind the adventure game's plot, and includes a list of spells you can

use, and monsters you may meet.

The objective of the game is to rescue the Elf Princess Edora, and kill the evil witch Magra.

The first episode is set in a village, and is text and graphics. The screen display includes a picture of each location, a status display indicating your strength, both physical and spiritual, your combat ability, the time, the phase of the moon (important in spell casting) and so on. The lower part of the screen is used for text instructions, and command entry. This episode follows fairly standard adventure format, with a few deviations. Items present in a location will only be listed a command — and even then, some things which can be 'got' will not be there. You have to guess where certain things can be found, and



proceed on the assumption that you are right. ■ the wood, for example, you will not be told that deadly nightshade is growing, but you can still pick it up.

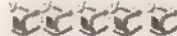
Most of the items collected in Episode 1 are spell components which you need in Episodes 2 and 3.

These latter two sections are presented in a slightly different format from Episode 1: instead of a graphic depiction of your present location, you see a map of the maze of caves or castle rooms you are moving through. The screen display is otherwise the same.

*Magra* can be a little slow, and the repetition of 'I don't understand' gets very wearing, but — these minor complaints aside — it is a very challenging package.

Mastertronic should be thanked by all adventure fans for rescuing it from the wreck of Carnell Software. They also rescued Stuart Galloway and Roy Carnell, who created the Third Continent series and we should be seeing some interesting packages coming from Mastertronic over the next few months.

Martin Croft



## Bust-up

**Program** *Ghostbusters Micro*  
Commodore 64 **Price** £10.99  
**Supplier** Activision, 15 Harley House, Marylebone Road, Regents Park, London NW1.

In general, spin-offs tend to be rather second-rate products riding on the back of some other success.

So, it was with great trepidation that I loaded *Ghostbusters*, thinking back to the very funny movie I saw earlier this month.

The film itself (not yet released in this country) is amazing... so why have Activision launched the game now, instead of waiting for the buzz that the film is certain to cause?

Somewhere in the distance, coincidentally, some radio began to play the *Ghostbusters* hit theme. Catchy little tune. I did a double take: the sound was coming from my Commodore! Synchronised with the music, the words were being displayed, together with a little bouncing white ball ■ tell me what ■ sing. I was invited to press the space bar. "Ghostbusters!" it cried. Wow! Feet



tapping, I started to play the game.

It is a 10% business, 10% strategy, 80% arcade game. ■ a starting sequence you are given \$10,000 with which you buy your ghostbusting equipment. Then the fun starts. There are three main sequences. The city map display shows you where there is a psychic disturbance, and you trace a path there from your current position. You are then shown — in plan view — on a three-lane highway en route which gives you an opportunity to catch roaming ghosts.

When you reach your destination you have a view of a building (again very well done) with a ghost (or slimer) whizzing around outside. You drop your trap and position your crew so the slimer is confined above the trap, then fire. "Ghostbusters!" the machine shouts... if you are successful

(you also get some money for doing this), otherwise one of your team is zapped and complains, "He slimed me!"

The speech synthesis is very good indeed. All this is done to that theme tune which far from becoming monotonous is really very catchy.

Why the early release? Because *Ghostbusters* the game

## Useful

**Program** *BBC Micro Utilities*  
**Price** £6.95 **Micro** BBC B  
**Supplier** Shiva Software, 64 Welsh Row, Nantwich, Cheshire

Bruce Smith has produced a number of books on assembly language programming on the BBC micro.

Now this cassette offers *Bee-mon*, a useful monitor program, and 17 of the longer machine-code routines from his book *BBC Micro Assembly Language* which is available separately from Shiva at £7.95.

*Bee-mon* allows you to study sections of the Beeb's memory. From its opening menu a disassembler option translates machine-code into the friendly assembler form and even shows the ASCII characters concerned where appropriate. The monitor option lets you see memory and register contents and even allows you to modify

is really just as good as the film. It isn't the most testing arcade game in the world, neither is it the most original, but what David Crane has produced is a game that is incredibly good fun to play and is faithful to the spirit of the film.

John Cook



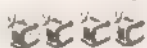
these directly. (It sensibly prevents direct modification of the stack pointer which could cause chaos!) The *Step* option lets you go line by line through a machine-code program and *Dump* lets you study sections of memory on screen or on a printer.

Two further menu options are *Memmove* to shift code from one place to another, though you should avoid &E00 to &41FF where *Bee-mon* itself resides; and *Fill* which lets you fill a specified area of memory with various characters. Finally, the program lets you access the Beeb's cassette interface so that you can *Save* and *Load* blocks of code.

The monitor program ■ use-ful enough but for the regular assembly coder the series of routines which follow may save a lot of typing time.

A useful and sensibly priced package.

Dave and Jan Watterson



## Role-play

**Program** *The Secret River*  
**Adventure One in the Runemagic Series** **Price** £7.95 **Micro** BBC B  
**Supplier** Trifid Software Research, Cullwood Lane, Ashley, New Milton, Hants

This game ■ tailor-made for Dungeons and Dragons fans. Here is an adventure that responds to the character playing it — and the outcome will change depending on the strengths and weaknesses of that character.

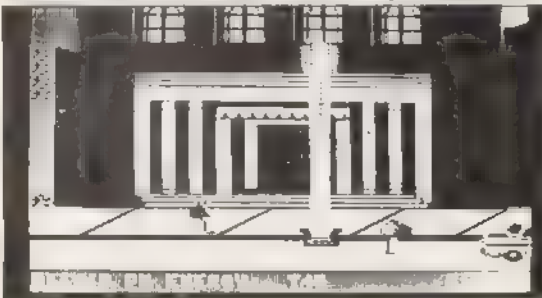
The first step in playing the game is to load a character generator program. This assigns a set of attributes and an amount of money to your persona. The money can be used to buy weapons, spells and armour. Here a certain amount

of skill must be applied in the choices you make.

The game is a fantasy story where the object ■ to locate and drink from a magical green river which ■ guarded by trolls. The usual tasks are presented — finding and using various objects on the journey; fighting and casting spells. However, the outcome of fights and dangers will be affected by the skills and weaponry of your character; and his or her luck will also vary.

When you have succeeded you can save your character's newly developed skills and talents, put them through the character generator again and start afresh with a higher level of spending and abilities.

Dave and Jan Watterson







## Dan the Man

**Program** Hot Shoe **Micro** MSX  
**Price** £5.95 **Supplier** Eclipse Software, Longman House, Bunt Mill, Harlow, Essex.

**E**arly in the working life of any new micro it is difficult to be particularly critical about the games released for it.

It does take time for programmers to learn the strengths and weaknesses of a system, and tailor games to suit.

So when I say that *Hot Shoe* is one of the best MSX games I have seen so far, don't get too excited about it.

You are Dan the Atomiser Man who, as usual, is charged with the task of saving the Universe — this time from an exploding Reactor.

In the first screen, you manoeuvre your spaceship left-right across the bottom of the screen, avoiding on-coming asteroids (yawn). Crashing into one will drain your energy, which you will need in the next

screen.

Having negotiated the asteroid belt and reached the reactor, you are beamed into the reactor core itself... a 3-D grid of coloured discs. These discs are numbered 1 to 6 and are counting up, towards 7. At this stage they flash and become permanently red, that is critical. If all the discs (all right then, reactor cores) reach this terminal state, the Universe explodes and the game is over.

You stop this from happening by jumping from disc to disc... every time you land on a 'core' its number is reduced by one. On reaching zero, they turn green. Stray 'atoms' hinder you in this task by jumping around the grid, draining your energy on contact. You need this energy for jumping around the grid, zapping atoms and on higher levels, deterring a robotic adversary.

Okay then, *Hot Shoe* isn't going to persuade anyone to swap their Spectrum for an MSX, but for first time buyers it should prove entertaining.

John Cook



## Mystery

**Program** Sherlock **Micro** Commodore 64 **Price** £14.95  
**Supplier** Melbourne House, Castle House, Castle Yard, Richmond.

**"W**ell, Watson, I wonder what you make of the curious business of Mrs Brown and Mrs Jones. The case has some interesting points to it, although our public transport system seems unnecessarily complicated these days."

*Sherlock* has now reached the 11, though the conversion certainly hasn't made Watson

any more intelligent, nor Lestrade any less obtuse. Nor does the Commodore seem immensely impressed when Sherlock makes some brilliant deductions, such as the fact that he's never going to reach King's Cross at all unless he remembers to get out of the hansom cab first.

Melbourne House's 'English' allows for some fairly sophisticated input, and simple graphics and reams of text scroll up smartly as required. However, because the game is played in 'real time', you need to get all the relevant movements more or less word perfect in order to turn up at the right places on time.

The game plays slightly differently each time as well, just to throw you off-beam when you decide to have one more go.

Melbourne House claims the vocabulary enables you to 'interrogate the suspects' and 'discuss the case' — so far I have to admit my interrogation is limited to "Tell me your alibi". Lestrade tells me not to be silly when I attempt a reasonable discussion, and Watson keeps

getting lost (last seen heading south down Leatherhead High Street).

The whole thing is madde-nigly frustrating. I suspect it could well have stumped the real Holmes.

Personally, I reckon Major Percival Foulkes did it, but then so does Lestrade, and he never got it right in the books.

Christina Erskine



## Frustrating

**Program** Underwilde **Micro** Spectrum 48K **Price** £9.95 **Supplier** Ultimate-Play-the-Game, The Green, Ashby de la Zouch, Leicestershire

**U**nderwilde is everything you expect from an Ultimate game. Technically excellent, with an ingeniously imaginative and well implemented game concept that is handsitly difficult.

So why do I find playing the game so annoying? Not challenging... just a pain.

The game itself starts with your nicely animated persona in a multi-levelled complex of caves, connected by natural shafts and chimneys. You move around by jumping and to travel up you can hitch a lift on passing bubbles of volcanic gas. Your task... deliberately vague... is to locate and take some weapons scattered around the complex (an axe, a sword and a bow, I think) then go on to fight the 'devil' in his lair. I can promise you, this is not going to be easy. You are constantly attacked by various well designed floating nasties

who don't kill you... they just push you around (although this itself can be fatal if you are pushed off the bubble of volcanic gas you are travelling up a shaft on, and consequently plummet down four levels to your doom).

This is what I found so infuriating. I can take being shot to bits in *Elite*. I don't mind being dissipated in *Tir Na Nog*. But you try being pushed around for the best part of the evening and see if you like it.

If you have a weapon you can kill them off easily enough, but still more come on, nudging you off ledges and generally getting in the way. I'm a pretty even tempered bloke, but the Spectrum came that close to being thrown out the window. Let me promise you — *Knight Lore* is a lot more relaxing.

Having said that, it's big — *Underwilde* has at least 250 locations by my reckoning — a lot of people are going to buy it, and quite right too.

And it's going to be a bumper New Year for Spectrum repairers.

John Cook



# 5 WINNING CLASSICS FROM

# MICROMEGA



## BRAXX BLUFF

Our ultimate 3D program — the multi-screen mission to save the dying crawler crew trapped at Braxx Bluff. Undock and land, walk in search of the crawler, drive it through the marsh, the ruins and the desert — one track wrong and you are dead! — skim the rocky seas at top speed... the natives are after your energy, but caution costs time and the crew are dying. There never was a cockpit-view mission like the one to Braxx Bluff!

Full Throttle places you on the saddle of a 500cc Grand Prix motorcycle. You can choose to race on any of ten of the world's top racing circuits. As a newcomer, you are started at the back of the grid in a field of 40 bikes. You have the best bike in the race, but that alone will not help you!

## FULL THROTTLE



## Codename MAT

MAT ■ mankind's last hope! The desperate plan to place in the mind of a teenager the combined tactical skills of all the planetary leaders in the solar system. Now your mind is MAT's mind. Take control of the USS Centurion Battle Cruiser and Tactical Command Centre to control the planetary defence fleets against the Myon attacks in MISSION: ALIEN TERMINATION.

3D as you have never seen before on your Spectrum! £6.95 will put you right on the saddle of the Big Bike! Ride deep into the forest through day and night, chasing the enemy riders.

## DEATHCHASE

Weeve through the trees at breakneck speed and watch out for helicopters and tanks — the greatest prizes of all!



## Kentilla

Where netherbeast Grako is building his power. There's much to discover and dangers abound. Free-moving agents may help you or hinder, but might be befriended if ways can be found. The alchemist lore-work was false and a failure, but renders good service in different vein, vanquished aggressors might be your protector. In perilous places of dark, death and pain. Of devious problems and magical task, this song is a warning, a riddle, a clue. To Caraland's saviour it offers a little. So mark well its lines for the saviour is

**AT £6.95  
EACH  
FOR THE  
SPECTRUM**

Selected titles  
available through  
larger branches of



John  
Menzies

spectrum

WOOLWORTH

**JUST RELEASED**

## JASPER

For the 48K Spectrum the most amazing arcade adventure yet with 22 screens of stunning cartoon animated graphics seeing is believing





## Beyond Basic

Adam Denning takes a look at three new language packages for the Sinclair QL

Various software companies seem to be working overtime to back up Sinclair's assertion that the QL is a serious machine. There are now a number of assemblers, a BCPL compiler, a Pascal compiler and a Lisp interpreter with promises of a full ISO Pascal and Lattice C to come.

**Pascal from Computer One. Computer One, Science Park, Milton Road, Cambridge CB4 4BE. Price £39.95.**

The first language package for the QL — apart from SuperBasic — was a Pascal compiler from Computer One. This package costs £39.95 and comes on a microdrive cartridge complete with a respectable long manual. It is not a true compiler as the time-honoured system of compiling into a compact code which is then interpreted at run time is used. This code occupies far less space than the corresponding true 68000 machine code, but it is of course slower.

The Pascal package must be seen as a system in its own right rather than as a development environment as the compiled programs cannot be run outside of the package. The Pascal program is started by the normal auto-boot process and this saves some resident procedure space to put a procedure called simply *Pascal* into. Invoking this procedure from SuperBasic — by typing its name and pressing *Enter* — loads the whole Pascal system from microdrive and enters the command state.

This stage is represented by a menu with eight options, from source editing to file deletion. The operation most likely to be undertaken first is the compilation of the example programs given. These range from the *Towers of Hanoi* problem to a microdrive back-up utility, using decidedly non-standard Pascal to access the QDOS trap routines. To be accepted by the compiler each source file must be terminated with *.pas* and the object code produced is given the *.qip* extension, standing for 'QL Pascal'.

All the examples compile, of course, but only the back-up utility can be described as useful. The compilation process is rather slow, perhaps because the compiler is itself written in Pascal and therefore has to be interpreted. Whatever, the resultant code is immediately executable simply by selecting the *Run* option and typing in the filename in response to the prompt. This highlights one of the more useful aspects of the system: as the compiler and the rest of the Pascal system has to reside in *mdv1* it is assumed that the source and resultant object will be on *mdv2*, so the system

This would make the machine capable of supporting almost as many languages as the BBC micro, and also make it a much more viable proposition to other software houses who have previously been waiting in the wings, wondering whether the QL is going to be worth supporting or not.

defaults to that drive. This means that to compile a program called, say, *mdv2-testprog.pas*, one has to type only *testprog* for the compiler to find the file and act on it. Running the program follows the same principle.

The editor is invoked from menu option 1 and will accept any form of filename, so it could be used to edit almost anything. However, it is in by no means the most ideal form being only a very basic screen editor which does not have repetitive or block commands. It does have two virtues, though. Starting a new line will cause the cursor to be positioned directly under the first character on the previous line, thus giving a degree of automatic indentation. More usefully, if a Pascal program is compiled with errors, these errors are introduced into the source file at appropriate points. Subsequent editing of this file makes debugging a much simpler process, as the errors themselves cannot be edited out but are removed by the compiler when they are no longer a true representation of the error.

The language itself is an extremely odd version of Pascal, with many standard features and an awful lot of non-standard ones. The code is by no means portable — no other system could support the added features, yet almost every program written will want to take advantage of them. The ability to get as close to machine code as this system allows is great for the budding systems programmer, but the whole object is defeated when it is remembered that no program can run on its own — in other words the programs always have to be executed in the Computer One Pascal environment. If a commercial software house were to develop programs using this package it would find it impossible to distribute the product as there would have to be an assumption that every user has a Computer One Pascal compiler!

So, one's whole understanding of why one should purchase a Pascal compiler is turned upside down by this Computer One product — it is great for learning the language and writing utilities for individual use on the QL, but as a product development system it doesn't enter the running. If Computer One could be persuaded to distribute the interpreter and run-times

separately then this situation could change.

The short example of the language in action (see listing 1) simulates a procedure to read in a decimal number from the current input device. The program is an example of how programs written in BCPL might be converted to Pascal. From the same example given later in BCPL it is easy to see not many people would care to simulate it in Pascal...

**BCPL from Metacomco, 26 Portland Square, Bristol BS2 8RX. Price £59.95.**

QL BCPL by Metacomco is the most useful language currently available for the QL. It compiles to true 68000 machine-code and is written in such a way that the programs can be run as independent jobs — they will multi-task with whatever is going on elsewhere in the machine.

The system comes supplied with the necessary compiler files, a linker and a

```

program Read;
  a program to simulate an I/O device procedure 1

const
  CHARS = 256;
  space = 32;
  tab = 9;

var
  ch: char;
  i: integer;
  j: integer;
  k: integer;
  l: integer;
  m: integer;
  n: integer;
  o: integer;
  p: integer;
  q: integer;
  r: integer;
  s: integer;
  t: integer;
  u: integer;
  v: integer;
  w: integer;
  x: integer;
  y: integer;
  z: integer;
  aa: integer;
  ab: integer;
  ac: integer;
  ad: integer;
  ae: integer;
  af: integer;
  ag: integer;
  ah: integer;
  ai: integer;
  aj: integer;
  ak: integer;
  al: integer;
  am: integer;
  an: integer;
  ao: integer;
  ap: integer;
  aq: integer;
  ar: integer;
  as: integer;
  at: integer;
  au: integer;
  av: integer;
  aw: integer;
  ax: integer;
  ay: integer;
  az: integer;
  ba: integer;
  bb: integer;
  bc: integer;
  bd: integer;
  be: integer;
  bf: integer;
  bg: integer;
  bh: integer;
  bi: integer;
  bj: integer;
  bk: integer;
  bl: integer;
  bm: integer;
  bn: integer;
  bo: integer;
  bp: integer;
  bq: integer;
  br: integer;
  bs: integer;
  bt: integer;
  bu: integer;
  bv: integer;
  bw: integer;
  bx: integer;
  by: integer;
  bz: integer;
  ca: integer;
  cb: integer;
  cc: integer;
  cd: integer;
  ce: integer;
  cf: integer;
  cg: integer;
  ch: integer;
  ci: integer;
  cj: integer;
  ck: integer;
  cl: integer;
  cm: integer;
  cn: integer;
  co: integer;
  cp: integer;
  cq: integer;
  cr: integer;
  cs: integer;
  ct: integer;
  cu: integer;
  cv: integer;
  cw: integer;
  cx: integer;
  cy: integer;
  cz: integer;
  da: integer;
  db: integer;
  dc: integer;
  dd: integer;
  de: integer;
  df: integer;
  dg: integer;
  dh: integer;
  di: integer;
  dj: integer;
  dk: integer;
  dl: integer;
  dm: integer;
  dn: integer;
  do: integer;
  dp: integer;
  dq: integer;
  dr: integer;
  ds: integer;
  dt: integer;
  du: integer;
  dv: integer;
  dw: integer;
  dx: integer;
  dy: integer;
  dz: integer;
  ea: integer;
  eb: integer;
  ec: integer;
  ed: integer;
  ee: integer;
  ef: integer;
  eg: integer;
  eh: integer;
  ei: integer;
  ej: integer;
  ek: integer;
  el: integer;
  em: integer;
  en: integer;
  eo: integer;
  ep: integer;
  eq: integer;
  er: integer;
  es: integer;
  et: integer;
  eu: integer;
  ev: integer;
  ew: integer;
  ex: integer;
  ey: integer;
  ez: integer;
  fa: integer;
  fb: integer;
  fc: integer;
  fd: integer;
  fe: integer;
  ff: integer;
  fg: integer;
  fh: integer;
  fi: integer;
  fj: integer;
  fk: integer;
  fl: integer;
  fm: integer;
  fn: integer;
  fo: integer;
  fp: integer;
  fq: integer;
  fr: integer;
  fs: integer;
  ft: integer;
  fu: integer;
  fv: integer;
  fw: integer;
  fx: integer;
  fy: integer;
  fz: integer;
  ga: integer;
  gb: integer;
  gc: integer;
  gd: integer;
  ge: integer;
  gf: integer;
  gg: integer;
  gh: integer;
  gi: integer;
  gj: integer;
  gk: integer;
  gl: integer;
  gm: integer;
  gn: integer;
  go: integer;
  gp: integer;
  gq: integer;
  gr: integer;
  gs: integer;
  gt: integer;
  gu: integer;
  gv: integer;
  gw: integer;
  gx: integer;
  gy: integer;
  gz: integer;
  ha: integer;
  hb: integer;
  hc: integer;
  hd: integer;
  he: integer;
  hf: integer;
  hg: integer;
  hh: integer;
  hi: integer;
  hj: integer;
  hk: integer;
  hl: integer;
  hm: integer;
  hn: integer;
  ho: integer;
  hp: integer;
  hq: integer;
  hr: integer;
  hs: integer;
  ht: integer;
  hu: integer;
  hv: integer;
  hw: integer;
  hx: integer;
  hy: integer;
  hz: integer;
  ia: integer;
  ib: integer;
  ic: integer;
  id: integer;
  ie: integer;
  if: integer;
  ig: integer;
  ih: integer;
  ii: integer;
  ij: integer;
  ik: integer;
  il: integer;
  im: integer;
  in: integer;
  io: integer;
  ip: integer;
  iq: integer;
  ir: integer;
  is: integer;
  it: integer;
  iu: integer;
  iv: integer;
  iw: integer;
  ix: integer;
  iy: integer;
  iz: integer;
  ja: integer;
  jb: integer;
  jc: integer;
  jd: integer;
  je: integer;
  jf: integer;
  jg: integer;
  jh: integer;
  ji: integer;
  jj: integer;
  jk: integer;
  jl: integer;
  jm: integer;
  jn: integer;
  jo: integer;
  jp: integer;
  jq: integer;
  jr: integer;
  js: integer;
  jt: integer;
  ju: integer;
  jv: integer;
  jw: integer;
  jx: integer;
  jy: integer;
  jz: integer;
  ka: integer;
  kb: integer;
  kc: integer;
  kd: integer;
  ke: integer;
  kf: integer;
  kg: integer;
  kh: integer;
  ki: integer;
  kj: integer;
  kk: integer;
  kl: integer;
  km: integer;
  kn: integer;
  ko: integer;
  kp: integer;
  kq: integer;
  kr: integer;
  ks: integer;
  kt: integer;
  ku: integer;
  kv: integer;
  kw: integer;
  kx: integer;
  ky: integer;
  kz: integer;
  la: integer;
  lb: integer;
  lc: integer;
  ld: integer;
  le: integer;
  lf: integer;
  lg: integer;
  lh: integer;
  li: integer;
  lj: integer;
  lk: integer;
  ll: integer;
  lm: integer;
  ln: integer;
  lo: integer;
  lp: integer;
  lq: integer;
  lr: integer;
  ls: integer;
  lt: integer;
  lu: integer;
  lv: integer;
  lw: integer;
  lx: integer;
  ly: integer;
  lz: integer;
  ma: integer;
  mb: integer;
  mc: integer;
  md: integer;
  me: integer;
  mf: integer;
  mg: integer;
  mh: integer;
  mi: integer;
  mj: integer;
  mk: integer;
  ml: integer;
  mn: integer;
  mo: integer;
  mp: integer;
  mq: integer;
  mr: integer;
  ms: integer;
  mt: integer;
  mu: integer;
  mv: integer;
  mw: integer;
  mx: integer;
  my: integer;
  mz: integer;
  na: integer;
  nb: integer;
  nc: integer;
  nd: integer;
  ne: integer;
  nf: integer;
  ng: integer;
  nh: integer;
  ni: integer;
  nj: integer;
  nk: integer;
  nl: integer;
  nm: integer;
  nn: integer;
  no: integer;
  np: integer;
  nq: integer;
  nr: integer;
  ns: integer;
  nt: integer;
  nu: integer;
  nv: integer;
  nw: integer;
  nx: integer;
  ny: integer;
  nz: integer;
  oa: integer;
  ob: integer;
  oc: integer;
  od: integer;
  oe: integer;
  of: integer;
  og: integer;
  oh: integer;
  oi: integer;
  oj: integer;
  ok: integer;
  ol: integer;
  om: integer;
  on: integer;
  oo: integer;
  op: integer;
  oq: integer;
  or: integer;
  os: integer;
  ot: integer;
  ou: integer;
  ov: integer;
  ow: integer;
  ox: integer;
  oy: integer;
  oz: integer;
  pa: integer;
  pb: integer;
  pc: integer;
  pd: integer;
  pe: integer;
  pf: integer;
  pg: integer;
  ph: integer;
  pi: integer;
  pj: integer;
  pk: integer;
  pl: integer;
  pm: integer;
  pn: integer;
  po: integer;
  pp: integer;
  pq: integer;
  pr: integer;
  ps: integer;
  pt: integer;
  pu: integer;
  pv: integer;
  pw: integer;
  px: integer;
  py: integer;
  pz: integer;
  qa: integer;
  qb: integer;
  qc: integer;
  qd: integer;
  qe: integer;
  qf: integer;
  qg: integer;
  qh: integer;
  qi: integer;
  qj: integer;
  qk: integer;
  ql: integer;
  qm: integer;
  qn: integer;
  qo: integer;
  qp: integer;
  qq: integer;
  qr: integer;
  qs: integer;
  qt: integer;
  qu: integer;
  qv: integer;
  qw: integer;
  qx: integer;
  qy: integer;
  qz: integer;
  ra: integer;
  rb: integer;
  rc: integer;
  rd: integer;
  re: integer;
  rf: integer;
  rg: integer;
  rh: integer;
  ri: integer;
  rj: integer;
  rk: integer;
  rl: integer;
  rm: integer;
  rn: integer;
  ro: integer;
  rp: integer;
  rq: integer;
  rr: integer;
  rs: integer;
  rt: integer;
  ru: integer;
  rv: integer;
  rw: integer;
  rx: integer;
  ry: integer;
  rz: integer;
  sa: integer;
  sb: integer;
  sc: integer;
  sd: integer;
  se: integer;
  sf: integer;
  sg: integer;
  sh: integer;
  si: integer;
  sj: integer;
  sk: integer;
  sl: integer;
  sm: integer;
  sn: integer;
  so: integer;
  sp: integer;
  sq: integer;
  sr: integer;
  ss: integer;
  st: integer;
  su: integer;
  sv: integer;
  sw: integer;
  sx: integer;
  sy: integer;
  sz: integer;
  ta: integer;
  tb: integer;
  tc: integer;
  td: integer;
  te: integer;
  tf: integer;
  tg: integer;
  th: integer;
  ti: integer;
  tj: integer;
  tk: integer;
  tl: integer;
  tm: integer;
  tn: integer;
  to: integer;
  tp: integer;
  tq: integer;
  tr: integer;
  ts: integer;
  tt: integer;
  tu: integer;
  tv: integer;
  tw: integer;
  tx: integer;
  ty: integer;
  tz: integer;
  ua: integer;
  ub: integer;
  uc: integer;
  ud: integer;
  ue: integer;
  uf: integer;
  ug: integer;
  uh: integer;
  ui: integer;
  uj: integer;
  uk: integer;
  ul: integer;
  um: integer;
  un: integer;
  uo: integer;
  up: integer;
  uq: integer;
  ur: integer;
  us: integer;
  ut: integer;
  uu: integer;
  uv: integer;
  uw: integer;
  ux: integer;
  uy: integer;
  uz: integer;
  va: integer;
  vb: integer;
  vc: integer;
  vd: integer;
  ve: integer;
  vf: integer;
  vg: integer;
  vh: integer;
  vi: integer;
  vj: integer;
  vk: integer;
  vl: integer;
  vm: integer;
  vn: integer;
  vo: integer;
  vp: integer;
  vq: integer;
  vr: integer;
  vs: integer;
  vt: integer;
  vu: integer;
  vv: integer;
  vw: integer;
  vx: integer;
  vy: integer;
  vz: integer;
  wa: integer;
  wb: integer;
  wc: integer;
  wd: integer;
  we: integer;
  wf: integer;
  wg: integer;
  wh: integer;
  wi: integer;
  wj: integer;
  wk: integer;
  wl: integer;
  wm: integer;
  wn: integer;
  wo: integer;
  wp: integer;
  wq: integer;
  wr: integer;
  ws: integer;
  wt: integer;
  wu: integer;
  wv: integer;
  ww: integer;
  wx: integer;
  wy: integer;
  wz: integer;
  xa: integer;
  xb: integer;
  xc: integer;
  xd: integer;
  xe: integer;
  xf: integer;
  xg: integer;
  xh: integer;
  xi: integer;
  xj: integer;
  xk: integer;
  xl: integer;
  xm: integer;
  xn: integer;
  xo: integer;
  xp: integer;
  xq: integer;
  xr: integer;
  xs: integer;
  xt: integer;
  xu: integer;
  xv: integer;
  xw: integer;
  xx: integer;
  xy: integer;
  xz: integer;
  ya: integer;
  yb: integer;
  yc: integer;
  yd: integer;
  ye: integer;
  yf: integer;
  yg: integer;
  yh: integer;
  yi: integer;
  yj: integer;
  yk: integer;
  yl: integer;
  ym: integer;
  yn: integer;
  yo: integer;
  yp: integer;
  yq: integer;
  yr: integer;
  ys: integer;
  yt: integer;
  yu: integer;
  yv: integer;
  yw: integer;
  yx: integer;
  yy: integer;
  yz: integer;
  za: integer;
  zb: integer;
  zc: integer;
  zd: integer;
  ze: integer;
  zf: integer;
  zg: integer;
  zh: integer;
  zi: integer;
  zj: integer;
  zk: integer;
  zl: integer;
  zm: integer;
  zn: integer;
  zo: integer;
  zp: integer;
  zq: integer;
  zr: integer;
  zs: integer;
  zt: integer;
  zu: integer;
  zv: integer;
  zw: integer;
  zx: integer;
  zy: integer;
  zz: integer;
end;
  
```

screen editor. This editor is destined to be the most used editor on the QL as almost every product requiring an editor, including those from rival companies, is supplied with it.

BCPL is a very unusual language which has sadly been neglected by the home computer user but which is used extensively in the development of commercial software by many Cambridge based companies. The language is the grandfather of C, now very much in vogue for software development. BCPL still retains its unique flavour though with two major concepts. There are no data types in the language — no integers, floats, reals, booleans or whatever. Everything is represented by the BCPL word, which in this implementation is 32 bits wide. The word can hold any data type, be it a machine address, a number or a

pointer, and consecutive groups of words can be identified as a vector which is the closest BCPL gets to an array. This lack of data types means that the language is unbelievably flexible but it does make the programmer totally responsible for any notional meaning of a word. The idea of a vector is fundamental to the second important BCPL concept -- the global vector. This is an area of store devoted to holding such things as the addresses of procedures and functions, the values of variables which may be changed by the whole system and any other data which the programmer wishes to make global.

As the global vector is always at a defined point within the run-time system it is a very simple process to introduce program overlays — section of code which can be loaded during a program run, linked into the global vector and used, then unlinked and removed. Consequently programs which in total would be much larger than the machine Ram available can be compiled and successfully run.

BCPL is also rich in semantic structures, so that the repetition commands include *While...Until*, *Repeat...While* and *Repeat...Until*. All the more popular constructs available in C all have their origins here - the conditional expression, the common *Start* (main in C) procedure and section brackets.

BCPL is very easy to learn and surprisingly easy to read, it is a well thought out mixture of high-level and low-level ideas, so it is ideal for the systems programmer. It has been used to write editors, assemblers, compilers, interpreters and almost anything else you could think of. It has clear input/output handling and the ability to interface machine-code routines with ease through the global vector.

BCPL for home micros was first seen on the BBC micro, where a highly sophisticated system in Rom can be bought for a rather high price.

The Metacomco QL implementation is very similar and as long as one is aware of the difference in data sizes and channel opening conditions, programs written on one machine will successfully compile and run on the other. QL BCPL lacks a few of the more esoteric procedures supplies with Acornsoft BCPL, but the two packages are similar enough to show the universal nature of BCPL. QL BCPL also includes numerous routines to take advantage of the QL's facilities such as windowing, as well as a set of superior floating-point procedures.

If the Acornsoft implementation seems more comprehensive at first sight this is only because it is supplied as a language ROM intended to supplant Basic, while the QL system is intended to augment QDOS for those programmers who require the facilities available to them from BCPL. The other major difference between the two versions is that Acornsoft's BBC BCPL is compiled into a compact interpretive code called Cintercode while the QL compiler produces pure 68000

code. This in turn means that programs written in BCPL on the QL will run on any QL regardless of whether the end user has a compiler or not.

The BBC micro version won't allow this without the purchase of an additional package as all of Metacomco's new QL packages are written in BCPL using its own BCPL program.

The example program of BCPL in operation shows the *ReadN* procedure.

**Lisp from Metacomco, 26 Portland Square, Bristol BS2 8RZ. Price £59.95.**

**Q**L Lisp is another Metacomco product, again selling at £59.95. Most of the development was carried out by Dr Arthur Norman and JP Fitch, who worked on the Acornsoft Lisp product on the BBC micro and Electron. For this reason QL Lisp is substantially similar to the Acorn product but has the added virtue of being two years younger and therefore rather more versatile.

Nevertheless, anyone considering buying it as a Lisp tutorial aid would be well advised to buy the Acornsoft book *LISP on the BBC micro* by Arthur Norman and Gillian Cattell. Every example in that book which does not use functions specific to the BBC micro will work on the OL implementation.

very difficult to spot!

QL Lisp is supplied on microdrive with numerous examples and a reasonable manual, describing all the built-in functions and variables and explaining how to use the Lisp system. Apart from the multi-tasking capability the similarity to Acornsoft Lisp is obvious, so all your favourite predefined Beeb functions can be transferred across to the QL and used in this new environment.

The major difference between the two Lisp versions is the full turtle graphics package supplied with the QL Lisp, allowing easy graphics routines and the addition of many of the functions which were 'missing' from Acornsoft Lisp, such as *Append*. File handling, although superficially the same, somehow comes across as being more natural on the QL. Preparing a source file with the supplied editor and then using the *Read* function to read it in seems the obvious thing to do. Functions such as this make Lisp program development that much easier.

Lisp has been frequently described as the natural language for expert systems writing, but its capabilities are by no means limited to that area. The example shows (not necessarily very elegantly) that the language is also capable of the more basic computational requirements. In theory at least, most applications could be written in Lisp. This is unlikely to be a good idea as the interpretation of the code takes some time. When 512K is available for the Ql and Metacomco fulfils its promise of a full Cambridge Lisp for the machine, then perhaps Lisp can be used more seriously. As it stands at the moment this system is only really useful as a teaching aid, but at that it performs admirably.

## Conclusions

**Computer One Pascal:** Unless you're desperate, wait for the full ISO Pascal compiler **Metacomco BCPL:** It's my favourite language so I'm a little biased, but the serious programmer would undoubtedly find it a useful purchase

**Metacomco Lisp:** If you want to learn the language or are capable of thinking up some things to do with it, then this package is probably for you. It's likely to be the best Lisp for the QL until Metacomco brings out its larger version.

[illegible]

tion, with the useful bonus that all the techniques and technical details are relevant to both versions.

A Lisp variable is an identifier, which could be associated with an atomic value (such as 'A', 'O' or 43) or a list, which is an interconnection of atoms and other lists, with the smallest possible list being the () null lists. It is more difficult to describe Lisp succinctly than other programming languages, so perhaps the example listing of a Lisp program shown here helps. It performs essentially the same function as the Pascal and BCPL examples, but the similarity is

[illegible]



**DORCAS**  
SOFTWARE  
PRESENT

# THE Runes OF ZENDOS

- High Resolution Graphics
- Full Animation
- Sentence Input
- 12 Separate adventures
- Sound Effects

The tiny principality of DORCASIA was a pleasant fertile land until the wizard ZENDOG used his evil powers to cast the country into perpetual darkness until all citizens pledge obedience to him.

It is known that through the SPELL OF DARKNESS, Zendog has trapped the spirit of each month into one of 12 GOLDEN TEMPUS RUNES or RUNIC HOUR GLASSES hidden deep within his mysterious and magical castle.

As the land dies in the grip of the black desolation a hero must be found to locate and destroy the 12 hour glasses thus releasing the months and returning Dorcasia to the natural forces of the seasons.

Each glass has a RUNIC inscription around its base which you must read and understand. Only saying these words will lift that part of the spell. To protect the hour glasses Zendog has placed them in 12 separate rooms in his castle, each room linked to a different exterior gateway by a devious passage.

Depending on which entrance you select, Zendog's spells which change the locations of rooms within his castle to confuse you. The menacing creatures and challenging problems which confront you at every turn mean that only the brave and the clever will succeed.



## THE ORACLE'S CAVE

Our best seller available for the  
48K SPECTRUM and COMMODORE 64.

Oracle's Cave is a unique adventure game featuring continuously displayed high resolution graphics and text, a new cave layout and event sequence for every game and a time limit on every adventure.

Available on cassette  
from leading retailers  
or direct from:

**DORCAS SOFTWARE**

3 The Oasis, Glenfield,  
Leicester LE3 8QS  
at £7.95 (inc. VAT)  
Postage and Packing FREE

**SPECTRUM 48K**



# MIRRORSOFT



Caesar is a cheeky young cat on mousing duty in Mr McGreggor's larder, but this time the mice have outwitted him and Mr McGreggor has kicked him out . . now read on . .

## £7.95

Available now on speedy loading cassette for Commodore 64. Coming soon on Spectrum 48K. Recommended for 3 to 8 year-olds

A new concept in early learning software. Caesar's Travels is a unique combination — a complete animated story program on cassette with a 64-page illustrated storybook.

Young readers choose what Caesar does next in an exciting adventure which has multiple endings. Either book or program can be used on its own. Bedtime stories will never be the same again!



**SPECIAL OFFER**

Also available in a special double cassette pack with the original and widely praised Caesar the Cat arcade game

## £9.95

Mirrorsoft programs are available from selected branches of Boots, WH Smith and Spectrum, and all leading software stockists. Or order direct (cheque, Access or Barclaycard) from MIRRORSOFT, FREEPOST, Bromley, Kent BR2 9UX (no stamp needed).



# HIGH SPEED



**COMMODORE 64** owners, at last the long wait is over — **FASTBACK** allows multipart software to load around ten times faster and run independently of the utility. For example 'The Hobbit' loads in 150 seconds with **FASTBACK**.

Supplied on tape with full instructions  
**ONLY £9.95**

## AMSTRAD

**SPEEDMASTER** is here. Allows choice of save speed. Approx.  $2 \times$  faster.

**ONLY £7.95**

## TAPE TO DISK TRANSFER UTILITIES

Transfer games etc. to disk. Supplied on tape with full instructions for:—

**BBC** . . . . . **£9.95**

**ATARI (All models)** . . . . . **£9.95**

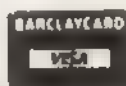
**COMMODORE 64  
NEW IMPROVED VERSION**

**DISCO**

No user knowledge required.

We guarantee this is the best available.

*Still only*  
**£9.95**



All prices include VAT,  
Post & Packing. Cheques, P.O.  
or Phone your Card Number to:



# EVESHAM MICRO CENTRE

Bridge St, Evesham, Worcestershire

**Tel: 0386 49641**

**NEW SHOP NOW OPEN — Micro Centre,**  
1756 Pershore Rd, Cotteridge, Birmingham Tel: 021-458 4564

**TRADE AND OVERSEAS ORDERS WELCOME**

# Games Designer Competition

Design an arcade game!

**T**hink you can design an arcade game? This is your chance to put all those great ideas into practice. We want you to design the sequel to Elite's *Kokotoni Wilf*.

**K**okotoni Wilf from Elite Software — one of this Autumn's top selling games on both the Commodore 64 and the Spectrum is to have a sequel. The plot? — that's for you to decide!

*Popular Computing Weekly* offers you the chance to use your own ideas, characters, plot and so on to create the sequel to *Kokotoni Wilf* which will be published by Elite in the new year.

The winner(s) will be credited with the storyline design in all advertising and promotion, and the winner(s) name(s) will be featured in the packaging. In addition, a royalty of 6% of sales achieved will be paid to the winning designer or design team.

## What we want you to do

The competition is open to both individual designers or design teams. You are not asked to actually program the game. All you have to do is to prepare a storyboard — a series of screen drawings or sketches — for the sequel which should explain the action from the first screen to the last.

The finished storyboard should be detailed enough for Elite's programmers and designers to use without any major changes — set yourself a limit of no less than 20 screens of action and no more than 60. It might be helpful to divide your storyboard into two sections, a general guide to the story including overall objectives and method of scoring, etc (limit yourself to a maximum of 800 words). The second section should be much more specific detailing exactly what is going on where in each screen, indicating such things as sprites, background layout and movement paths. To help you, we show on the right one such storyboard from a screen in the first *Kokotoni Wilf* program.

## How to enter

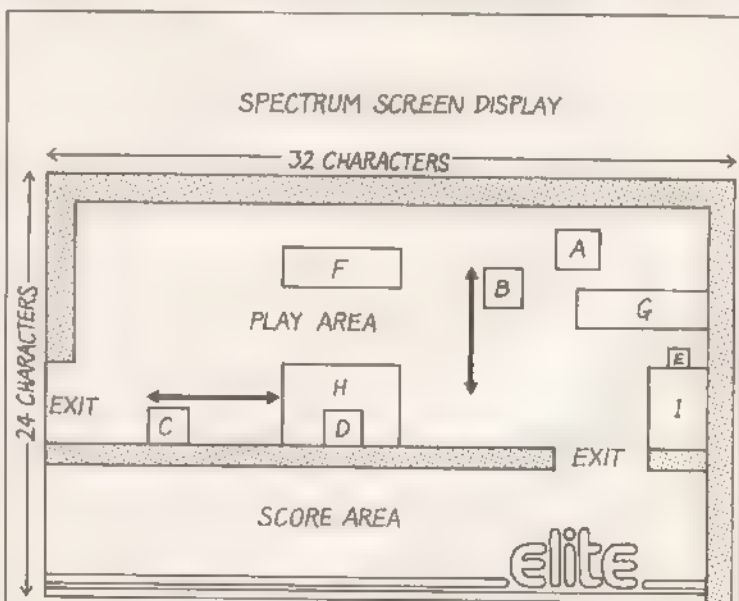
Completed storylines and storyboards should be submitted to *Kokotoni Wilf* Competition, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP, to arrive no later than 1 January 1985.

All entrants requiring an acknowledgement of receipt should submit a stamped self-addressed envelope. Entrants requiring their work to be returned after judging should send a suitable post paid self-addressed envelope with the entry.

The judges decision will be final. Don't forget to include your name and address! Ten runners up will receive copies of the game which will be produced for the Spectrum and Commodore 64.

It is important to remember that the program you create is to be a sequel and so, in a general way, you should maintain the theme and atmosphere of the original. For anyone not familiar with *Kokotoni Wilf* here is the story so far:

"Legend has it that many hundreds of years ago somewhere in Northern Europe lived a great Magician known as Ulrich. Ulrich knew of a magic amulet, fragments of which had been scattered throughout time. Ulrich wished to wield its power, but he was too old and infirm for such an arduous adventure and so charged his protegee Kokotoni Wilf with the epic task. Ulrich sent Wilf back in time to the age of the great dinosaurs, there to begin his quest through the ages for each fragment of the Amulet. Ulrich has provided Wilf with magic wings and time gates to pass from age to age. Your task is to guide Wilf in his epic quest."



## TIME-ZONE 3: SCREEN 1

- A: STARTING POSITION OF KOKOTONI WILF
- : STARTING POSITION OF 'BOOK' SPRITE
- C: STARTING POSITION OF 'BOILING POT' SPRITE
- D: ANIMATED 'FIRE' SPRITE
- E: LOCATION OF AMULET FRAGMENT
- F, G, H, I: SKULL SHELF; POTS SHELF; OPEN RANGE; SKELETON.

BOLD ARROWS SHOW SPRITE MOVEMENT PATTERNS.  
SHADED AREA SHOWS IMPENETRABLE BORDERS.



# Question time

A testing time for 64 owners with the Question and Answer Module by **Dominick Devlin**

The Question and Answer Module is a ready-made component for an educational program in which a testee is asked a set of questions or can choose between several sets. The user programs the questions with their answers; the Module displays each question on the screen, lets the testee input his answer, checks if it is right and displays the result. Each question is automatically numbered.

The Module, a machine-code routine, can be entered by means of the instructions listed at the end of this article. The educational program should preferably consist of two separate parts, the first part containing the instructions for the Module, followed by instructions to load and run the second part containing the actual questions and answers.

The questions and answers are written like lines of print statements except that, instead of the instruction `Print`, there is the letter 'q' for a question line and 'a' for an answer line. Each question must be immediately followed by its answer or alternative answers.

A question can take up more than one line; just put a 'q' at the beginning of each line. Alternative answers must be placed on separate lines, each beginning with the letter 'a'. All characters, including colour and cursor ones, can be put in 'q' and 'a' lines. The symbol `^` will be understood as a carriage return. The symbol from the `F7` key will be replaced by inverted commas.

Before the first 'q' line is reached, the Module must be called. This is done by the instruction `Sys 49152`, placed at the end of the preceding line. Before that instruction, the Module needs to have some information poked into locations 251 and 252: 251 should be poked with 0, 1 or 2 (or only 0 or 1 when the Module is first called).

0 will allow the testee to see the questions and answers and input his answers. It will wipe out any previous answers he has given. '1' is the same as '0' except that each answer will be immediately checked, and the testee will be told the result (including the correct answer).

'2' allows the testee to see the questions again, together with his previous answers. The answers are checked and the testee is told the results. Location 252 must be poked with the lowest ASCII value to be considered in the comparison of answers. The value must be at least 35.

This is one of the ways in which the programmer can increase the intelligence of the Module so that it recognizes an answer as right, even if it is not exactly the same as the programmed answer. With 35 poked into 252, the Module ignores space

and colour/cursor keys etc (even when their value is greater than 128), as well as differences between upper and lower case. With `Poke 252,48`, most punctuation signs will also be ignored.

In addition, the programmer can get the Module to accept, for example, both "encyclopedias" and "edias" by putting, in the place of the hyphen, the symbol produced from the `F5` function key. I shall come back to the `F5` key in a moment.

As soon as the Module reaches a line that does not begin with 'q' or 'a', it exits and the instructions reached are handled as Basic instruction. Two pieces of information are left in locations 253 and 254: `Peek (253)` for the number of questions answered correctly and `Peek (254)` for the number of questions asked.

Study the example program. The questions and answers have been placed in a subroutine (lines 5000 to 6000), which is executed twice. In the first round (see line 10), the testee is to input his answers without seeing the results. In the second round (see

line 30), he will see the questions again, together with his answers and the correct answers. In addition to the differences automatically ignored, no account will be taken, for example, of hyphens or brackets.

The testee must be told to press `Return` to see each question (line 20). After the last question has been reviewed, the final result will be displayed (line 40). Also shown is what might appear on the screen in the second round.

The answers input by the testee have been marked with 'AAA'. This extra input was not seen by the Module. The testee's answer corresponds to the programmed answer up to the end of the answer line, or up to the symbol from the `F5` key, the Module stops comparing and displays 'answer is right'. The `F5` symbol was used in lines 5040 and 6060 to allow for the French spelling of Cameroon.

To break out of the question and answer routine, insert the symbol "18" in the top left corner of the screen and press `Return`.

The Module itself is perched at the top of the area \$C000 to \$CFFF (49152 to 53247 in decimals), most of that area being available to hold the testee's answers. The whole of the programming space in the Commodore 64 could thus consist almost entirely of questions and answers. At a rough guess, there should be room for five sets consisting of 100 questions each.

PRESS RETURN for each question

>1<. Of which country is Yaounde the capital?

cameroun AAA  
answer is >right<: Cameroon

>2<. Name one of the countries in Indochina

Viet-Nam AAA  
answer is Kampuchea  
<formerly Cambodia>  
also Laos  
also >right< Vietnam

>3<. Who wrote:  
"For east is east  
And west is west  
And never the twain shall meet."  
(two words)

William Shakespeare AAA  
answer is Rudyard Kipling

MARKS: 2 out of 3

N.B. >...< indicates reverse characters

## Example Program

```

1 rem test
5 poke 53272,23:rem upper/lower case
10 poke 251,0:gosub 5000
20 print:"PRESS RETURN for each question" CLR
30 poke 251,2 poke 252,46:gosub 5000
40 print:"MARKS:";peek (253);"out of";peek (254)
50 end
5000 sys 49152
5030 q"Of which country is Yaounde+the capital?+"
5040 a"Cameroun" f5
5050 q"Name one of the countries+in Indochina+"
5060 a"Kampuchea+(formerly Cambodia)" f5
5061 a"Laos"
5062 a"Vietnam"
5070 q"Who wrote:+"For east is east+And west is west" f7
5080 q"and never the twain shall meet.:(two words)+" f7
5090 a"Rudyard Kipling" f5
5000 return

```

## Main Program

```

10 REM *QUESTION & ANSWER MODULE*
20 FOR P=49152 TO 49461
30 READ D:POKE P,D:NEXT END
100 DATA 160, 0, 132, 253, 132, 254, 132, 90, 169, 53
110 DATA 133, 93, 169, 193, 133, 96, 133, 94, 140, 47
120 DATA 193, 140, 48, 193, 140, 49, 193, 173, 0, 4
130 DATA 240, 23, 160, 3, 177, 122, 133, 57, 200, 177
140 DATA 122, 133, 58, 200, 177, 122, 201, 65, 240, 125
150 DATA 73, 81, 208, 1, 197, 96, 240, 51, 230, 254
160 DATA 133, 96, 165, 251, 41, 2, 240, 3, 32, 207
170 DATA 255, 162, 2, 189, 47, 193, 41, 15, 56, 233
180 DATA 9, 105, 58, 176, 2, 169, 48, 157, 47, 193
190 DATA 202, 144, 236, 162, 25, 32, 8, 193, 165, 90
200 DATA 24, 101, 93, 144, 2, 230, 94, 133, 93, 160
210 DATA 5, 200, 177, 122, 208, 2, 169, 141, 201, 34
220 DATA 240, 245, 201, 95, 208, 2, 169, 13, 201, 136
230 DATA 208, 2, 169, 34, 32, 210, 255, 201, 141, 208
240 DATA 226, 160, 2, 170, 177, 122, 136, 208, 250, 168
250 DATA 240, 2, 134, 123, 136, 132, 122, 76, 27, 192
260 DATA 32, 207, 255, 145, 93, 200, 201, 13, 208, 246
270 DATA 32, 210, 255, 208, 32, 132, 91, 160, 0, 132
280 DATA 92, 166, 96, 240, 4, 162, 11, 208, 20, 230
290 DATA 96, 165, 251, 41, 2, 240, 219, 177, 93, 32
300 DATA 210, 255, 200, 201, 13, 208, 240, 132, 90, 165
310 DATA 251, 240, 184, 32, 8, 193, 162, 16, 230, 91
320 DATA 164, 91, 177, 122, 240, 30, 201, 135, 240, 26
330 DATA 164, 92, 41, 127, 197, 252, 144, 236, 133, 88
340 DATA 230, 92, 177, 93, 41, 127, 197, 252, 144, 226
350 DATA 197, 88, 240, 220, 208, 5, 32, 8, 193, 230
360 DATA 253, 76, 109, 192, 189, 20, 193, 32, 210, 255
370 DATA 232, 201, 32, 208, 245, 96, 141, 65, 78, 83
380 DATA 87, 69, 82, 160, 73, 83, 32, 65, 76, 83
390 DATA 79, 32, 18, 82, 73, 71, 72, 84, 146, 58
400 DATA 32, 13, 18, 0, 0, 0, 146, 46, 32, 13

```





# FOX — YOUR COMPUTER!!!

With our superior add-ons for the  
**SPECTRUM + VIC-20**

THE ULTIMATE IN JOYSTICK  
INTERFACES

**SPECTRUM**



THE FOX PROGRAMMABLE INTERFACE —  
AN INTERFACE WITH

- ◇ Complete compatibility with all programs
- ◇ In built memory to store up to 16 different games keysets at one time
- ◇ A reset switch so no power off during game changes
- ◇ Full casing
- ◇ Through port for further expansion
- ◇ Full compatibility with the microdrive
- ◇ Built in pseudo ROM facility with room for personal tool kit
- ◇ Quickshot II joystick rapid fire compatible

The interface reviewed in Sinclair User as "very good value and very clever and provides the easiest interface on the market to use"

Once programmed,  
never needs  
programming  
again!

ALL THIS FOR **ONLY £28.95 INCL**  
or COMPLETE WITH A QUICKSHOT II JOYSTICK FOR

**ONLY £34.95 INCL**  
or with QUICKSHOT II JOYSTICK

**ONLY £36.95**

PLUG IN. SWITCH ON AND SIMPLY PLAY THE GAME WITH FOX

## ZX SPECTRUM 32K UPGRADE

ISSUE 2 AND ISSUE 3

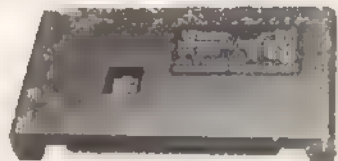
TAKE YOUR 16K SPECTRUM TO 48K IN SIMPLE STEPS. THE KIT REVIEWED BY SINCLAIR USER AS "THE BEST BUY" FULL INSTRUCTIONS SUPPLIED AND FULL GUARANTEE GIVEN

**ONLY £23.00 INCL**

## AMAZING!!! FOR THE VIC-20

16K SWITCHABLE RAM PACK

- Gives you the option of 16K, 8K or 3K in one cartridge.
- Simply plugs into rear port.
- Fully compatible with all existing motherboards.
- Fully guaranteed (1 year).
- 14 day moneyback guarantee if not delighted.
- No re-addressing of existing Basic programs needed.



**£34.95**

All products are stocked and are despatched within 14 days

PLEASE SEND ME

- ☐ INTERFACE
- ☐ INTERFACE + JOYSTICK
- ☐ SPECTRUM UPGRADE
- ☐ VIC-20 16K RAM PACK

Name .....

Address .....

Barclaycard No ..... Visa

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



## FOX ELECTRONICS

FOX HOUSE 35 MARTHAM ROAD, HEMSBY  
GREAT YARMOUTH, NORFOLK NR29 4NQ  
Tel: 0493 732420 (24 HR Ansaphone/sales)



# No man's land

ORIC/ATMOS

ORIC/ATMOS

OTHER TITLES FOR CBM64/V20 SPECTRUM X163 AVAILABLE ON REQUEST



**0803 CATEGORIC** (action game). Take command of a cruiser engaged in battle against fighter planes and submarines. Use the radar and sonar systems to detect and destroy the enemy before you are sunk. £ 7.95



**0840 STYX** (arcade). Destroy the castles of the Dark One which guard the river Styx. Struggle against villains, the eyes of the devil and his minions to vanquish evil. £ 8.50



**0494 DEBUG** (utility). A monitor/debugger to debug your programmes in machine code; position of internal registers, set breakpoints, step through programmes. £ 11.95



**0498 OPTIMUM** (home). Manage up to 4 different accounts, keep track of expenditure and compare with your monthly or yearly budget. Just what you need to keep the household accounts in order. £ 9.95



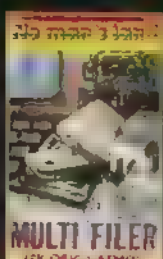
**0495 FIRE FLASH** (arcade). Prevent the aliens from sabotaging the fuel depot and avoid enemy fire by passing into hyper space. An attractive and challenging arcade game in 100% machine code. £ 8.50



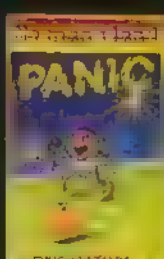
**0826 TYRANN** (adventure). Can you find your way through the labyrinth and liberate Queen Tyrann from her torment? A first-class adventure game with text and graphics. £ 9.95



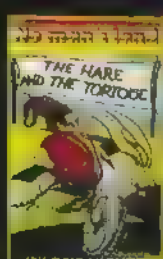
**0814 THE DIABOLICAL TOWER** (adventure). The Diabolical Tower has 60 floors, each one fraught with danger. Your mission is to seek out the treasure. £ 5.50



**0810 MULTIFILER** (business). A powerful programme for creating files. Choose your own criteria adapted to your requirements. Rapid sort and search features in machine code and possibility of memorising over 30000 characters. Extremely simple to use. £ 14.95



**0465 PANIC** (action). Catch the marauding apples by setting traps. 6 levels. £ 5.95



**0016 THE HARE AND THE TORTOISE** (education). A game for 3-8 year olds to teach the notions of right, left, up and down and counting. The hare and the tortoise decide to race. Who will win? The level of difficulty is adjustable to the child's ability. £ 6.50

## OTHER ORIC/ATMOS TITLES

- 0497 ADDRESS BOOK £ 9.95
- 0496 BANK ACCOUNT £ 12.50
- 0499 BASIC PLUS £ 9.95
- 0502 COMPUTER ASSISTED DESIGN £ 11.00
- 0804 CHARACTER GENERATOR £ 8.50
- 0466 CONCOURS HIPPIQUE £ 2.95
- 0464 CW MORSE £ 14.95
- 0508 FINANCIAL CALCULATOR £ 9.95
- 0507 INVOICING £ 14.95
- 0506 LEARNING FORTH £ 16.95
- 0509 LIBRARY CATALOG £ 9.95
- 0511 SCREEN HIT £ 2.95
- 0513 SUPERCOPY £ 2.95

## RETAILERS CONTACT:

**CentreSoft**

OR ASK YOUR DISTRIBUTOR TO CONTACT US

DISTRIBUTORS AND OVERSEAS ENQUIRIES CONTACT:

JANET FELTON, ENNELEC NO MAN'S LAND 110 BIS RUE DU CALLECLERC 93606 PANTIN CEDEX FRANCE TEL.: 33-1-840.24.31

## MAIL ORDER:

POST COUPON TO HIGH TECH UNITS 1 & 2 COWLOW DEVELOPMENTS WATFORD Herts WD17 7JH  
LANE DARTMOUTH LANGSHIRE

PRICES INCLUDE POSTAGE AND PACKING FOR UK ONLY OVERSEAS ADD

REF	TITLE	QTY	TOTAL PRICE

PO/CHEQUE ENCLOSED OR DEBIT ACCESS/VISA IF CARD EXPIRY DATE

**IMPORTANT:** All cheques or cards payable to NO MAN'S LAND and sent to High

NAME

ADDRESS

POSTCODE



The ZX Spectrum  
Expansion System. Only £99.<sup>95</sup>

# Sinclair's complete alternative to floppy discs...



**The ZX Spectrum  
Expansion System contains:**

- One ZX Microdrive
- One ZX Interface 1
- One wallet containing four programs on Microdrive cartridge
- Microdrive demonstration cartridge
- One blank Microdrive cartridge
- Full documentation
- Connecting lead for Microdrive/Interface 1
- ZX Net Lead

**The new ZX Spectrum +**

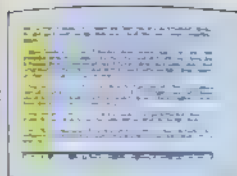
Fully compatible with all Spectrum software and peripherals, including this Expansion System

### Tasword Two word processor

Turns your ZX Spectrum into a high-quality word processor!

Tasword Two has all the essential features of professional word processing packages – move and copy, insert, margin settings, help pages, find and replace, and much more.

Written by Tasman Software Ltd.  
Usual price (RRP): £13.90



### Masterfile filing system

Address lists... personal files... stock inventories... stamp or album collections... club records... recipes... if you can file it, you can Masterfile it!

Masterfile is a menu-driven filing and retrieval system of immense power. Display formats are user-defined, so the range of applications is enormous.

Written by Campbell Systems Ltd.  
Usual price (RRP): £16.95



### Games Designer

Now, all you need to create original games are original ideas – and Games Designer! It has eight, very different, pre-programmed games for you to play as they are – or modify out of all recognition!

There's never before been an easier, more enjoyable way into games design.

Written by Quicksilver Ltd.  
Usual price (RRP): £14.95



### Ant Attack

The all-time classic 3D strategy game, Ant Attack combines stunning Escher-like graphics with fast-moving action and a real tactical challenge.

Your task is to enter the walled city, seek out your captured partner, and escape. At all times you can choose from four angles of view. But beware: the city is patrolled by giant ants.

Written by Quicksilver Ltd. Usual price (RRP): £6.95



All programs run on a 48K Spectrum or Spectrum+. Recommended retail prices are for each program on cassette.

# ...includes this great set of Microdrive programs!



The unique ZX Microdrive system sets the Spectrum apart from all other home computers.

It gives you all the advantages of floppy disc drives – at a fraction of the cost. And tests show the Microdrives are faster than some disc drives.

Now, the complete Microdrive system comes in one package – together with four of the best-ever Spectrum programs, on Microdrive cartridges.

This software alone would normally cost you over £50. Yet the Sinclair price for the complete ZX Spectrum Expansion Pack is just £99.95!

You'll find full details of its contents in the panel opposite.

### ZX Microdrives – another Sinclair first!

The ZX Microdrive is a revolutionary fast access/mass storage device. And it's the only truly affordable alternative to disc drives...

● Loads or saves up to 85K of program or data from Microdrive cartridges.

● Just 3.5 seconds to access a typical file.

● Only 9 seconds to load a typical 48K program.

### The ZX Microdrive cartridge – a unique storage medium.

Smaller than a matchbox, the ZX Microdrive cartridge packs in a massive amount of data and programs.

Each Microdrive cartridge holds at least 85K bytes of data or programs (that's 30 pages of A4 text). And you can store up to 50 different data files per cartridge, identified by titles of your choice.

Every cartridge comes in its own protective case. Simply remove the cartridge, slot it into the Microdrive, and it's ready to use.

### ZX Interface 1 – adds powerful new capabilities to your Spectrum.

ZX Interface 1 connects to the back of your Spectrum and controls up to 11 Microdrives. (Additional Microdrives are available for £49.95 each.)

It also gives you:

● An RS 232 interface – to link your Spectrum with full-size printers, other

computers using RS 232 (the industry-standard interface) and provide data transmission over telephone lines, via modems.

● ZX Net – lets you set up a local area network of up to 64 Spectrums, for high-speed data communications between you and Spectrum-owning friends.

### At your local Sinclair stockist – today!

The ZX Spectrum Expansion System adds an exciting new dimension to Spectrum and Spectrum+ computing. At £99.95 it's superb value too.

To find out more, call in at your local Sinclair stockist now!

Sinclair Research Ltd,  
Camberley (0276) 685311.

 ZX, ZX Spectrum, ZX Microdrive, ZX Net and ZX Interface are Trade Marks of Sinclair Research Ltd

# sinclair



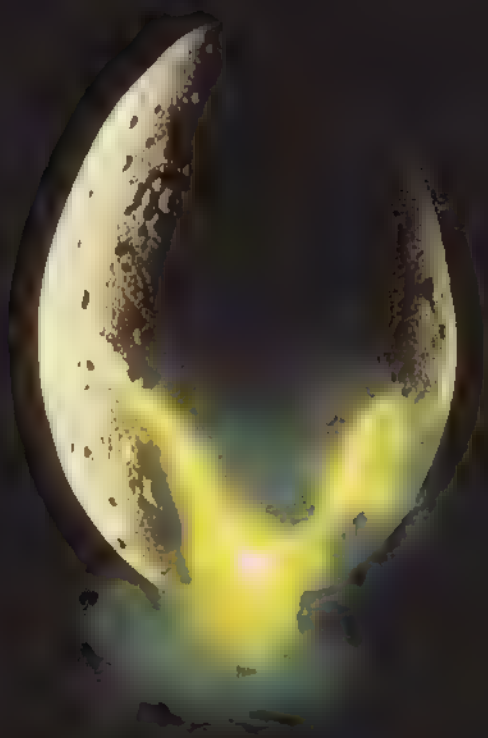
A

L

I

E

N

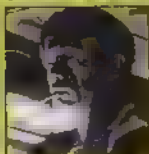


In space no one can hear you scream.



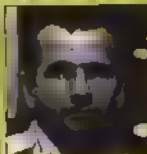
NAVIGATOR

Shy, Skilled and  
Intelligent - Powers Easily



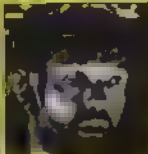
EXECUTIVE OFFICER

Direct, Imaginative,  
Cautious, Loyal



SCIENCE OFFICER

Secretive, Unhumble, Brilliant -  
Occasionally Bizarre



CAPTAIN

Safe, Dependable, Courageous -  
Excellent Leader



ENGINEERING OFFICER

Physically Strong, Laid Back,  
Potentially Rebellious



3RD OFFICER

Witty, Ambitious,  
Authoritative, Respected



ENGINEERING OFFICER

Cynical, Rebellious,  
Undeserving, Unhappily

**THE CREW**  
Personnel  
files follow -  
yours to  
command -  
well almost...

**MIND GAMES**  
SPECTRUM 48K · CBM64



Featuring  
the unique  
Personality Control System

No. 1 Golden Square, London W1R 3AB, Telephone 01-437 0626

£8.99

# A swing to the right

The second of three machine-code routines for the Dragon 32 by Roger Walton

This week's article gives Basic listings for machine-code routines which will scroll the PMode 3 screen to the right and upwards. The right scroll routine includes wrap-around but the upwards

scroll does not.

In both cases the full width of the screen is scrolled but the vertical extent of the scrolled screen area may be set by the user. This is done by Poking the two Y-co-

ordinates as shown in the Basic listings 2 and 3. The code is stored at different addresses, so that they can both be used together in a program.

Once the Basic programs have been run, the machine-code can be stored by using the Csave command. An example would be:

Csave "Rscroll",&H7EC2,&H7E5E,&H7EC2

the third address being the Exec address of the routine.

## Listing 2

```
100 ' LISTING 2
110 '*****
120 'SCROLL PROGRAM, R. Walton,
130 '*****
140 '150 ' This program scrolls
PMode 3 or 4 up the screen 160 '
170 ' The section of the screen
to be scrolled
180 ' is defined by it's lower
and upper Y coordinates which
should
190 ' be POKED into &H7E80 and
&H7E81 before EXECing the
machine code
200 CLEAR 100,&H7E78
210 FOR LOC=&H7E79 TO &H7EC0
220 READ P$
230 P$="&H"+P$ 240 P=VAL(P$)
250 POKE LOC,P 260 T=T+P
270 NEXT
280 IF T<>7951 THEN CLS:PRINT
"DATA ERROR":STOP
290 CLS:PRINT"DATA LOADED"
300 PRINT"USE EXEC &H7E79
310 PRINT"TO CALL THE SCROLL
320 DATA 16,00,06,06,00,1D,FF,00
330 DATA BF,86,20,F6,7E,80,3D,C3
340 DATA 06,00,FD,7E,7C,86,20,F6
350 DATA 7E,81,3D,C3,06,1F,1F,02
360 DATA 31,A8,E1,10,8F,7E,7E,BE
370 DATA 7E,7C,A6,88,20,A7,80,BC
380 DATA 7E,7E,26,F6,4F,10,BE,7E
390 DATA 7E,31,AB,20,10,BF,7E,7E
400 DATA A7,80,BC,7E,7E,26,F9,39
```

## Listing 3

```
100 ' LISTING 3
110 '*****
120 ' SCROLL PROGRAM, R. Walton
130 '*****
140 '
```

```
150 ' This program scrolls PMode 3
graphics right
```

```
160 ' across the screen, with
wrap-around built in
```

```
170 ' The section of the screen
to be scrolled
```

```
180 ' is defined by it's X and
Y coordinates which should
```

```
190 ' be POKED into &H7EC9 and
&H7ECA before EXECing the machine
code
```

```
200 CLEAR 100,&H7EC1
```

```
210 FOR LOC=&H7EC2 TO &H7F5E
```

```
220 READ P$ 230 P$="&H"+P$
```

```
240 P=VAL(P$) 250 T=T+P
```

```
260 POKE LOC,P 270 NEXT
```

```
280 IF T<>16932 THEN CLS:PRINT
```

```
"DATA ERROR":STOP
```

```
290 CLS:PRINT"CODE LOADED."
```

```
300 PRINT"EXEC &H7EC2 TO"
```

```
310 PRINT"CALL RIGHT-SCROLL"
```

```
320 STOP
```

```
330 DATA 16,00,0B,06,00,1D,FF,00
```

```
340 DATA A0,00,00,00,00,00,86,20
```

```
350 DATA F6,7E,C9,3D,C3,06,00,FD
```

```
360 DATA 7E,C5,86,20,F6,7E,CA,3D
```

```
370 DATA C3,06,1F,FD,7E,C7,BE,7E
```

```
380 DATA C7,7F,7E,CB,31,88,E1,10
```

```
390 DATA BF,7E,CE,7F,7E,CC,A6,84
```

```
400 DATA B5,01,26,27,85,02,26,2E
```

```
410 DATA 64,84,64,84,1C,FE,30,1F
```

```
420 DATA BC,7E,CE,25,05,17,00,29
```

```
430 DATA 20,F2,A6,01,BA,7E,CB,BA
```

```
440 DATA 7E,CC,A7,01,BC,7E,C5,22
```

```
450 DATA C8,20,39,34,02,86,40,B7
```

```
460 DATA 7E,CC,35,02,20,CE,34,02
```

```
470 DATA 86,80,B7,7E,CB,35,02,20
```

```
480 DATA C7,C6,40,F7,7E,CD,C6,02
```

```
490 DATA 1C,FE,64,84,25,0D,34,04
```

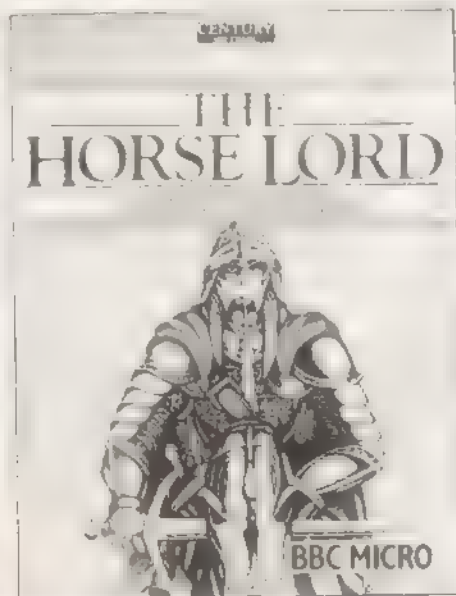
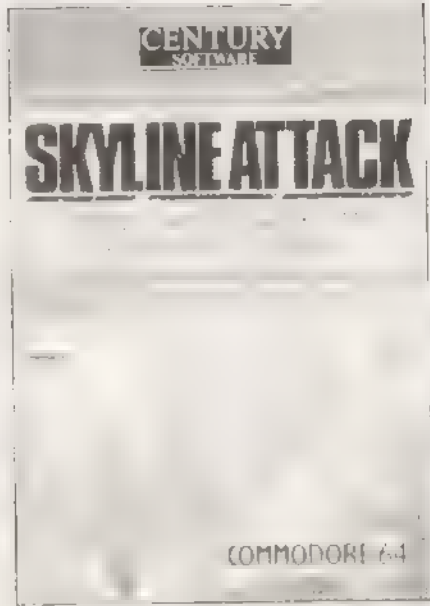
```
500 DATA C6,80,F7,7E,CD,35,04,5A
```

```
510 DATA 26,EE,39,A6,01,BA,7E,CD
```

```
520 DATA A7,01,20,EA,39
```



CENTURY  
COMMUNICATIONS



## LEGEND

This superb role-playing fantasy game will stretch your adventuring skills to the limit. It's based on the bestselling novel *Legend* by David Gemmell and contains not one but two massive games for the 48K Spectrum.


Try it for yourself. Adventuring will never quite be the same again.

The pack contains:

- \* Cassette containing both programs
- \* The book
- \* Four-colour poster-size map of the land of Drenon
- \* Full instructions

£14.95 ISBN 07126 0602 5  
Sinclair 48K Spectrum

## STARFINDER

*Starfinder* gives you  you need to begin astronomy.

- \* Computer program displays star maps for any time, date and place on Earth.
- \* Unique 'space probe' enables you to identify stars, planets, Halley's Comet, etc.
- \* Print-out facility for star maps.
- \* Accompanying book by Heather Couper explains everything from black holes to constellations.

£12.95 ISBN 0 7126 0571 1  
BBC Micro/Electron

## SKYLINE ATTACK

Pilot your craft across 9 of the world's greatest cities.

This is one of the fastest, most flicker-free games ever written for the Commodore 64.

- \* Fabulous animated graphics
- \* 18 different types of alien
- \* Superfast loading
- \* First program ever to allow you to play another game while it loads!

£7.95 ISBN 7126 0578 9  
Commodore 64

## THE HORSE LORD

An entirely original arcade game by Jonathan Griffiths, author of *Snapper*.

You are Aldric the nobleman undertaking a messenger's ride to get to the castle.

You have to survive water jumps, enemy horsemen, footsoldiers and ambushes.

- \* Full mode 2 graphics
- \* Dual screens
- \* Full sound effects
- \* Joystick or keyboard

£7.95 ISBN 0 7126 0645 9  
BBC Micro

## ORDER FORM

To: Gill Small, TBS, Church Road, Tiptree, Colchester, Essex CO5 0SR

Please send me the following. Tick where applicable

### LEGEND

☐ Software pack £14.95  
(inc VAT and post & packing)

### STARFINDER

☐ Software pack £12.95  
(inc VAT and post & packing)

### SKYLINE ATTACK

☐ Cassette £7.95  
(inc VAT and post & packing)

### HORSE LORD

☐ Cassette £7.95  
(inc VAT and post & packing)

I enclose my cheque/postal order for £ (Cheques should be made payable to Tiptree Book Services Limited)

Please debit by Visa/Access account number  
\*delete as appropriate

Account Number

Name

Address

Signed   
(Please allow up to 28 days for delivery Subject to availability.)



# Completing the file

Continued from last week part two of Microfile by Peter Patton

After running the program you might want to create a new file. After considering what was said last week about the art of file design, select option 1 from the Main Menu.

Answer the prompts as they appear on screen. Firstly, enter the filename for this file, then the number of fields you will require. NB. If you allocate seven fields you must use seven fields, as blank field names are not allowed.

You will be prompted in turn for a field name and a field length for each of the fields. The field name is just a label to allow you to identify the data segments. If you make a mistake don't worry. After entering all the field names and lengths, you will be given the opportunity to amend any section.

Once you are happy that your file structure is as intended, select the Save parameters option and follow the prompts to save the file parameters which you have just created. If you Quit without saving the parameters will be lost.

## Entering Data

Select option 2 from the Main Menu then

select option 1 from the second menu. After loading the parameters for the file, the record layout will be displayed on the screen, and you will get the prompt: Load Data File (Y or N). Answer N. You will then get the prompt: Begin A New Data File (Y or N) answer this Y.

You are now ready to begin entering data into your file. If you wish to leave a field blank then simply press Enter and you will see that the cursor moves to the start of the next field. Note that you are not allowed to backspace out of the field, or to enter data beyond its preset limit.

## Saving Your Data

At the end of a session entering data, it is always advisable to Save the contents of the file. If you were to suffer a power cut before you had Saved the file, it would be lost. From the second menu select option 4 (Return to Main Menu), then from the main menu select option 3 (Save Data File). Follow the prompts and your file will be saved to cassette. If you are using the same cassette for both the file parameters and the data file, do not overwrite the parameters for the file!

Leave a big gap between the end of the parameters and the start of the data file, then label the cassette.

To load an existing data file, follow the procedure for starting a new file outlined above; however, when prompted to Load Data File (Y or N) answer yes. Then follow the prompts to load your file. You may now use options 2 and 3 from the second menu to explore the file. To add new records to the file simply select option 2 from the second menu, and select the '+' to add a record.

Finally, when searching for specific data in your files, you will be allowed to search on a single field of your choice. Such searches are set up in such a way as to find any ambiguous reference, and this can produce results which you may not expect. If for example you were looking for Pat to find the name Paton, you would also turn up names like Patterson, Patrick, Patton, etc. However, this feature is extremely powerful, and some of its usefulness would be lost if I were to take away its ambiguous aspects.

Using the Program:

Program Menus	
MAIN MENU	SECOND MENU
1 Create a New File	1 Load a New File
2 Run Main Program	2 Browse Through File
3 Save Data File	3 Search File
4 Exit From Program	4 Return to Main Menu

```

1570 ***** Search File *****
1580 FOR i=1 TO v:LOCATE 22,(i+5):PRINT STRING$(VAL$(RIGHT$(1999-i),2)),4
3:LINE
1590 GOSUB 2310:LOCATE 20,23:PRINT"Search On Field No. ":(i+1):GOSUB 21
:PRINT"VAL$(i)
1600 IF i=1 THEN PRINT CHR$(7):GOTO 1580
1610 GOSUB 2310:LOCATE 10,23:PRINT"Enter Data For Search?"
1620 LOCAL i=22,(i+5):VAL$(RIGHT$(1999-i),2):GOSUB 2150:GOTO
1630:GOTO 1610
1640 IF IN$(IN$,"nY") THEN 1650 ELSE GOTO 1690
1650 IF i=1 THEN 1660
1660 GOSUB 2310:LOCATE 20,23:PRINT"(Q)uit or (R)etry Search ":(i+1):GOTO
1670:GOTO 1650
1670 IF i=1 THEN 1680 ELSE IF i=2 THEN 1690 ELSE PRINT CHR$(7):GOTO
1680
1680 IF i=3 THEN 1690:GOTO 1640 ELSE IF i=4 THEN 1690 ELSE 1690
1690 FOR i=1 TO 5:PRINT" "
1700 FOR i=1 TO 5:LOCATE 22,(i+5)
1710 PRINT dat$(i):b=VAL$(RIGHT$(1999-i),2):PRINT"SPACES"b-LEN(dat$(i))
3:LINE
1720 GOSUB 2310:LOCATE 10,23:PRINT"(Q)uit or (R)etry Search ":(i+1):GOTO
1730:GOTO 1720
1730 IF i=1 THEN 1740
1740 IF i=2 THEN 1750 ELSE IF i=3 THEN GOTO 1780 ELSE IF i=4 THEN GOTO 1760
1750 PRINT CHR$(7):GOTO 1720
1760 GOSUB 2310:LOCATE 20,23:PRINT" " END OF FILE REACHED ":(i+1):GOTO
1770:GOTO 1720
1770 FOR i=1 TO 2000:PRINT" "
1780 FOR i=1 TO 2000:PRINT" "
1790 GOSUB 2310:LOCATE 10,23:PRINT" "
1800 GOSUB 2310:LOCATE 10,23:PRINT" "
1810 GOSUB 2310:LOCATE 10,23:PRINT" "
1820 GOSUB 2310:LOCATE 10,23:PRINT" "
1830 GOSUB 2310:LOCATE 10,23:PRINT" "
1840 GOSUB 2310:LOCATE 10,23:PRINT" "
1850 GOSUB 2310:LOCATE 10,23:PRINT" "
1860 GOSUB 2310:LOCATE 10,23:PRINT" "
1870 GOSUB 2310:LOCATE 10,23:PRINT" "
1880 GOSUB 2310:LOCATE 10,23:PRINT" "
1890 GOSUB 2310:LOCATE 10,23:PRINT" "
1900 GOSUB 2310:LOCATE 10,23:PRINT" "
1910 GOSUB 2310:LOCATE 10,23:PRINT" "
1920 GOSUB 2310:LOCATE 10,23:PRINT" "
1930 GOSUB 2310:LOCATE 10,23:PRINT" "
1940 GOSUB 2310:LOCATE 10,23:PRINT" "
1950 GOSUB 2310:LOCATE 10,23:PRINT" "
1960 GOSUB 2310:LOCATE 10,23:PRINT" "
1970 GOSUB 2310:LOCATE 10,23:PRINT" "
1980 GOSUB 2310:LOCATE 10,23:PRINT" "
1990 GOSUB 2310:LOCATE 10,23:PRINT" "
2000 GOSUB 2310:LOCATE 10,23:PRINT" "
2010 GOSUB 2310:LOCATE 10,23:PRINT" "
2020 GOSUB 2310:LOCATE 10,23:PRINT" "
2030 GOSUB 2310:LOCATE 10,23:PRINT" "
2040 GOSUB 2310:LOCATE 10,23:PRINT" "
2050 GOSUB 2310:LOCATE 10,23:PRINT" "
2060 GOSUB 2310:LOCATE 10,23:PRINT" "
2070 GOSUB 2310:LOCATE 10,23:PRINT" "
2080 GOSUB 2310:LOCATE 10,23:PRINT" "
2090 GOSUB 2310:LOCATE 10,23:PRINT" "
2100 GOSUB 2310:LOCATE 10,23:PRINT" "
2110 GOSUB 2310:LOCATE 10,23:PRINT" "
2120 GOSUB 2310:LOCATE 10,23:PRINT" "
2130 GOSUB 2310:LOCATE 10,23:PRINT" "
2140 GOSUB 2310:LOCATE 10,23:PRINT" "
2150 GOSUB 2310:LOCATE 10,23:PRINT" "
2160 GOSUB 2310:LOCATE 10,23:PRINT" "
2170 GOSUB 2310:LOCATE 10,23:PRINT" "
2180 GOSUB 2310:LOCATE 10,23:PRINT" "
2190 GOSUB 2310:LOCATE 10,23:PRINT" "
2200 GOSUB 2310:LOCATE 10,23:PRINT" "
2210 GOSUB 2310:LOCATE 10,23:PRINT" "
2220 GOSUB 2310:LOCATE 10,23:PRINT" "
2230 GOSUB 2310:LOCATE 10,23:PRINT" "
2240 GOSUB 2310:LOCATE 10,23:PRINT" "
2250 GOSUB 2310:LOCATE 10,23:PRINT" "
2260 GOSUB 2310:LOCATE 10,23:PRINT" "
2270 GOSUB 2310:LOCATE 10,23:PRINT" "
2280 GOSUB 2310:LOCATE 10,23:PRINT" "
2290 GOSUB 2310:LOCATE 10,23:PRINT" "
2300 GOSUB 2310:LOCATE 10,23:PRINT" "
2310 GOSUB 2310:LOCATE 10,23:PRINT" "
2320 GOSUB 2310:LOCATE 10,23:PRINT" "
2330 GOSUB 2310:LOCATE 10,23:PRINT" "
2340 GOSUB 2310:LOCATE 10,23:PRINT" "
2350 GOSUB 2310:LOCATE 10,23:PRINT" "
2360 GOSUB 2310:LOCATE 10,23:PRINT" "
2370 GOSUB 2310:LOCATE 10,23:PRINT" "
2380 GOSUB 2310:LOCATE 10,23:PRINT" "
2390 GOSUB 2310:LOCATE 10,23:PRINT" "
2400 GOSUB 2310:LOCATE 10,23:PRINT" "
2410 GOSUB 2310:LOCATE 10,23:PRINT" "
2420 GOSUB 2310:LOCATE 10,23:PRINT" "
2430 GOSUB 2310:LOCATE 10,23:PRINT" "
2440 GOSUB 2310:LOCATE 10,23:PRINT" "
2450 GOSUB 2310:LOCATE 10,23:PRINT" "
2460 GOSUB 2310:LOCATE 10,23:PRINT" "
2470 GOSUB 2310:LOCATE 10,23:PRINT" "
2480 GOSUB 2310:LOCATE 10,23:PRINT" "
2490 GOSUB 2310:LOCATE 10,23:PRINT" "
2500 GOSUB 2310:LOCATE 10,23:PRINT" "
2510 GOSUB 2310:LOCATE 10,23:PRINT" "
2520 GOSUB 2310:LOCATE 10,23:PRINT" "
2530 GOSUB 2310:LOCATE 10,23:PRINT" "
2540 GOSUB 2310:LOCATE 10,23:PRINT" "
2550 GOSUB 2310:LOCATE 10,23:PRINT" "
2560 GOSUB 2310:LOCATE 10,23:PRINT" "
2570 GOSUB 2310:LOCATE 10,23:PRINT" "
2580 GOSUB 2310:LOCATE 10,23:PRINT" "
2590 GOSUB 2310:LOCATE 10,23:PRINT" "
2600 GOSUB 2310:LOCATE 10,23:PRINT" "
2610 GOSUB 2310:LOCATE 10,23:PRINT" "
2620 GOSUB 2310:LOCATE 10,23:PRINT" "
2630 GOSUB 2310:LOCATE 10,23:PRINT" "
2640 GOSUB 2310:LOCATE 10,23:PRINT" "
2650 GOSUB 2310:LOCATE 10,23:PRINT" "
2660 GOSUB 2310:LOCATE 10,23:PRINT" "
2670 GOSUB 2310:LOCATE 10,23:PRINT" "
2680 GOSUB 2310:LOCATE 10,23:PRINT" "
2690 GOSUB 2310:LOCATE 10,23:PRINT" "
2700 GOSUB 2310:LOCATE 10,23:PRINT" "
2710 GOSUB 2310:LOCATE 10,23:PRINT" "
2720 GOSUB 2310:LOCATE 10,23:PRINT" "
2730 GOSUB 2310:LOCATE 10,23:PRINT" "
2740 GOSUB 2310:LOCATE 10,23:PRINT" "
2750 GOSUB 2310:LOCATE 10,23:PRINT" "
2760 GOSUB 2310:LOCATE 10,23:PRINT" "
2770 GOSUB 2310:LOCATE 10,23:PRINT" "
2780 GOSUB 2310:LOCATE 10,23:PRINT" "
2790 GOSUB 2310:LOCATE 10,23:PRINT" "
2800 GOSUB 2310:LOCATE 10,23:PRINT" "
2810 GOSUB 2310:LOCATE 10,23:PRINT" "
2820 GOSUB 2310:LOCATE 10,23:PRINT" "
2830 GOSUB 2310:LOCATE 10,23:PRINT" "
2840 GOSUB 2310:LOCATE 10,23:PRINT" "
2850 GOSUB 2310:LOCATE 10,23:PRINT" "
2860 GOSUB 2310:LOCATE 10,23:PRINT" "
2870 GOSUB 2310:LOCATE 10,23:PRINT" "
2880 GOSUB 2310:LOCATE 10,23:PRINT" "
2890 GOSUB 2310:LOCATE 10,23:PRINT" "
2900 GOSUB 2310:LOCATE 10,23:PRINT" "
2910 GOSUB 2310:LOCATE 10,23:PRINT" "
2920 GOSUB 2310:LOCATE 10,23:PRINT" "
2930 GOSUB 2310:LOCATE 10,23:PRINT" "
2940 GOSUB 2310:LOCATE 10,23:PRINT" "
2950 GOSUB 2310:LOCATE 10,23:PRINT" "
2960 GOSUB 2310:LOCATE 10,23:PRINT" "
2970 GOSUB 2310:LOCATE 10,23:PRINT" "
2980 GOSUB 2310:LOCATE 10,23:PRINT" "
2990 GOSUB 2310:LOCATE 10,23:PRINT" "
3000 GOSUB 2310:LOCATE 10,23:PRINT" "
3010 GOSUB 2310:LOCATE 10,23:PRINT" "
3020 GOSUB 2310:LOCATE 10,23:PRINT" "
3030 GOSUB 2310:LOCATE 10,23:PRINT" "
3040 GOSUB 2310:LOCATE 10,23:PRINT" "
3050 GOSUB 2310:LOCATE 10,23:PRINT" "
3060 GOSUB 2310:LOCATE 10,23:PRINT" "
3070 GOSUB 2310:LOCATE 10,23:PRINT" "
3080 GOSUB 2310:LOCATE 10,23:PRINT" "
3090 GOSUB 2310:LOCATE 10,23:PRINT" "
3100 GOSUB 2310:LOCATE 10,23:PRINT" "
3110 GOSUB 2310:LOCATE 10,23:PRINT" "
3120 GOSUB 2310:LOCATE 10,23:PRINT" "
3130 GOSUB 2310:LOCATE 10,23:PRINT" "
3140 GOSUB 2310:LOCATE 10,23:PRINT" "
3150 GOSUB 2310:LOCATE 10,23:PRINT" "
3160 GOSUB 2310:LOCATE 10,23:PRINT" "
3170 GOSUB 2310:LOCATE 10,23:PRINT" "
3180 GOSUB 2310:LOCATE 10,23:PRINT" "
3190 GOSUB 2310:LOCATE 10,23:PRINT" "
3200 GOSUB 2310:LOCATE 10,23:PRINT" "
3210 GOSUB 2310:LOCATE 10,23:PRINT" "
3220 GOSUB 2310:LOCATE 10,23:PRINT" "
3230 GOSUB 2310:LOCATE 10,23:PRINT" "
3240 GOSUB 2310:LOCATE 10,23:PRINT" "
3250 GOSUB 2310:LOCATE 10,23:PRINT" "
3260 GOSUB 2310:LOCATE 10,23:PRINT" "
3270 GOSUB 2310:LOCATE 10,23:PRINT" "
3280 GOSUB 2310:LOCATE 10,23:PRINT" "
3290 GOSUB 2310:LOCATE 10,23:PRINT" "
3300 GOSUB 2310:LOCATE 10,23:PRINT" "
3310 GOSUB 2310:LOCATE 10,23:PRINT" "
3320 GOSUB 2310:LOCATE 10,23:PRINT" "
3330 GOSUB 2310:LOCATE 10,23:PRINT" "
3340 GOSUB 2310:LOCATE 10,23:PRINT" "
3350 GOSUB 2310:LOCATE 10,23:PRINT" "
3360 GOSUB 2310:LOCATE 10,23:PRINT" "
3370 GOSUB 2310:LOCATE 10,23:PRINT" "
3380 GOSUB 2310:LOCATE 10,23:PRINT" "
3390 GOSUB 2310:LOCATE 10,23:PRINT" "
3400 GOSUB 2310:LOCATE 10,23:PRINT" "
3410 GOSUB 2310:LOCATE 10,23:PRINT" "
3420 GOSUB 2310:LOCATE 10,23:PRINT" "
3430 GOSUB 2310:LOCATE 10,23:PRINT" "
3440 GOSUB 2310:LOCATE 10,23:PRINT" "
3450 GOSUB 2310:LOCATE 10,23:PRINT" "
3460 GOSUB 2310:LOCATE 10,23:PRINT" "
3470 GOSUB 2310:LOCATE 10,23:PRINT" "
3480 GOSUB 2310:LOCATE 10,23:PRINT" "
3490 GOSUB 2310:LOCATE 10,23:PRINT" "
3500 GOSUB 2310:LOCATE 10,23:PRINT" "
3510 GOSUB 2310:LOCATE 10,23:PRINT" "
3520 GOSUB 2310:LOCATE 10,23:PRINT" "
3530 GOSUB 2310:LOCATE 10,23:PRINT" "
3540 GOSUB 2310:LOCATE 10,23:PRINT" "
3550 GOSUB 2310:LOCATE 10,23:PRINT" "
3560 GOSUB 2310:LOCATE 10,23:PRINT" "
3570 GOSUB 2310:LOCATE 10,23:PRINT" "
3580 GOSUB 2310:LOCATE 10,23:PRINT" "
3590 GOSUB 2310:LOCATE 10,23:PRINT" "
3600 GOSUB 2310:LOCATE 10,23:PRINT" "
3610 GOSUB 2310:LOCATE 10,23:PRINT" "
3620 GOSUB 2310:LOCATE 10,23:PRINT" "
3630 GOSUB 2310:LOCATE 10,23:PRINT" "
3640 GOSUB 2310:LOCATE 10,23:PRINT" "
3650 GOSUB 2310:LOCATE 10,23:PRINT" "
3660 GOSUB 2310:LOCATE 10,23:PRINT" "
3670 GOSUB 2310:LOCATE 10,23:PRINT" "
3680 GOSUB 2310:LOCATE 10,23:PRINT" "
3690 GOSUB 2310:LOCATE 10,23:PRINT" "
3700 GOSUB 2310:LOCATE 10,23:PRINT" "
3710 GOSUB 2310:LOCATE 10,23:PRINT" "
3720 GOSUB 2310:LOCATE 10,23:PRINT" "
3730 GOSUB 2310:LOCATE 10,23:PRINT" "
3740 GOSUB 2310:LOCATE 10,23:PRINT" "
3750 GOSUB 2310:LOCATE 10,23:PRINT" "
3760 GOSUB 2310:LOCATE 10,23:PRINT" "
3770 GOSUB 2310:LOCATE 10,23:PRINT" "
3780 GOSUB 2310:LOCATE 10,23:PRINT" "
3790 GOSUB 2310:LOCATE 10,23:PRINT" "
3800 GOSUB 2310:LOCATE 10,23:PRINT" "
3810 GOSUB 2310:LOCATE 10,23:PRINT" "
3820 GOSUB 2310:LOCATE 10,23:PRINT" "
3830 GOSUB 2310:LOCATE 10,23:PRINT" "
3840 GOSUB 2310:LOCATE 10,23:PRINT" "
3850 GOSUB 2310:LOCATE 10,23:PRINT" "
3860 GOSUB 2310:LOCATE 10,23:PRINT" "
3870 GOSUB 2310:LOCATE 10,23:PRINT" "
3880 GOSUB 2310:LOCATE 10,23:PRINT" "
3890 GOSUB 2310:LOCATE 10,23:PRINT" "
3900 GOSUB 2310:LOCATE 10,23:PRINT" "
3910 GOSUB 2310:LOCATE 10,23:PRINT" "
3920 GOSUB 2310:LOCATE 10,23:PRINT" "
3930 GOSUB 2310:LOCATE 10,23:PRINT" "
3940 GOSUB 2310:LOCATE 10,23:PRINT" "
3950 GOSUB 2310:LOCATE 10,23:PRINT" "
3960 GOSUB 2310:LOCATE 10,23:PRINT" "
3970 GOSUB 2310:LOCATE 10,23:PRINT" "
3980 GOSUB 2310:LOCATE 10,23:PRINT" "
3990 GOSUB 2310:LOCATE 10,23:PRINT" "
4000 GOSUB 2310:LOCATE 10,23:PRINT" "
4010 GOSUB 2310:LOCATE 10,23:PRINT" "
4020 GOSUB 2310:LOCATE 10,23:PRINT" "
4030 GOSUB 2310:LOCATE 10,23:PRINT" "
4040 GOSUB 2310:LOCATE 10,23:PRINT" "
4050 GOSUB 2310:LOCATE 10,23:PRINT" "
4060 GOSUB 2310:LOCATE 10,23:PRINT" "
4070 GOSUB 2310:LOCATE 10,23:PRINT" "
4080 GOSUB 2310:LOCATE 10,23:PRINT" "
4090 GOSUB 2310:LOCATE 10,23:PRINT" "
4100 GOSUB 2310:LOCATE 10,23:PRINT" "
4110 GOSUB 2310:LOCATE 10,23:PRINT" "
4120 GOSUB 2310:LOCATE 10,23:PRINT" "
4130 GOSUB 2310:LOCATE 10,23:PRINT" "
4140 GOSUB 2310:LOCATE 10,23:PRINT" "
4150 GOSUB 2310:LOCATE 10,23:PRINT" "
4160 GOSUB 2310:LOCATE 10,23:PRINT" "
4170 GOSUB 2310:LOCATE 10,23:PRINT" "
4180 GOSUB 2310:LOCATE 10,23:PRINT" "
4190 GOSUB 2310:LOCATE 10,23:PRINT" "
4200 GOSUB 2310:LOCATE 10,23:PRINT" "
4210 GOSUB 2310:LOCATE 10,23:PRINT" "
4220 GOSUB 2310:LOCATE 10,23:PRINT" "
4230 GOSUB 2310:LOCATE 10,23:PRINT" "
4240 GOSUB 2310:LOCATE 10,23:PRINT" "
4250 GOSUB 2310:LOCATE 10,23:PRINT" "
4260 GOSUB 2310:LOCATE 10,23:PRINT" "
4270 GOSUB 2310:LOCATE 10,23:PRINT" "
4280 GOSUB 2310:LOCATE 10,23:PRINT" "
4290 GOSUB 2310:LOCATE 10,23:PRINT" "
4300 GOSUB 2310:LOCATE 10,23:PRINT" "
4310 GOSUB 2310:LOCATE 10,23:PRINT" "
4320 GOSUB 2310:LOCATE 10,23:PRINT" "
4330 GOSUB 2310:LOCATE 10,23:PRINT" "
4340 GOSUB 2310:LOCATE 10,23:PRINT" "
4350 GOSUB 2310:LOCATE 10,23:PRINT" "
4360 GOSUB 2310:LOCATE 10,23:PRINT" "
4370 GOSUB 2310:LOCATE 10,23:PRINT" "
4380 GOSUB 2310:LOCATE 10,23:PRINT" "
4390 GOSUB 2310:LOCATE 10,23:PRINT" "
4400 GOSUB 2310:LOCATE 10,23:PRINT" "
4410 GOSUB 2310:LOCATE 10,23:PRINT" "
4420 GOSUB 2310:LOCATE 10,23:PRINT" "
4430 GOSUB 2310:LOCATE 10,23:PRINT" "
4440 GOSUB 2310:LOCATE 10,23:PRINT" "
4450 GOSUB 2310:LOCATE 10,23:PRINT" "
4460 GOSUB 2310:LOCATE 10,23:PRINT" "
4470 GOSUB 2310:LOCATE 10,23:PRINT" "
4480 GOSUB 2310:LOCATE 10,23:PRINT" "
4490 GOSUB 2310:LOCATE 10,23:PRINT" "
4500 GOSUB 2310:LOCATE 10,23:PRINT" "
4510 GOSUB 2310:LOCATE 10,23:PRINT" "
4520 GOSUB 2310:LOCATE 10,23:PRINT" "
4530 GOSUB 2310:LOCATE 10,23:PRINT" "
4540 GOSUB 2310:LOCATE 10,23:PRINT" "
4550 GOSUB 2310:LOCATE 10,23:PRINT" "
4560 GOSUB 2310:LOCATE 10,23:PRINT" "
4570 GOSUB 2310:LOCATE 10,23:PRINT" "
4580 GOSUB 2310:LOCATE 10,23:PRINT" "
4590 GOSUB 2310:LOCATE 10,23:PRINT" "
4600 GOSUB 2310:LOCATE 10,23:PRINT" "
4610 GOSUB 2310:LOCATE 10,23:PRINT" "
4620 GOSUB 2310:LOCATE 10,23:PRINT" "
4630 GOSUB 2310:LOCATE 10,23:PRINT" "
4640 GOSUB 2310:LOCATE 10,23:PRINT" "
4650 GOSUB 2310:LOCATE 10,23:PRINT" "
4660 GOSUB 2310:LOCATE 10,23:PRINT" "
4670 GOSUB 2310:LOCATE 10,23:PRINT" "
4680 GOSUB 2310:LOCATE 10,23:PRINT" "
4690 GOSUB 2310:LOCATE 10,23:PRINT" "
4700 GOSUB 2310:LOCATE 10,23:PRINT" "
4710 GOSUB 2310:LOCATE 10,23:PRINT" "
4720 GOSUB 2310:LOCATE 10,23:PRINT" "
4730 GOSUB 2310:LOCATE 10,23:PRINT" "
4740 GOSUB 2310:LOCATE 10,23:PRINT" "
4750 GOSUB 2310:LOCATE 10,23:PRINT" "
4760 GOSUB 2310:LOCATE 10,23:PRINT" "
4770 GOSUB 2310:LOCATE 10,23:PRINT" "
4780 GOSUB 2310:LOCATE 10,23:PRINT" "
4790 GOSUB 2310:LOCATE 10,23:PRINT" "
4800 GOSUB 2310:LOCATE 10,23:PRINT" "
4810 GOSUB 2310:LOCATE 10,23:PRINT" "
4820 GOSUB 2310:LOCATE 10,23:PRINT" "
4830 GOSUB 2310:LOCATE 10,23:PRINT" "
4840 GOSUB 2310:LOCATE 10,23:PRINT" "
4850 GOSUB 2310:LOCATE 10,23:PRINT" "
4860 GOSUB 2310:LOCATE 10,23:PRINT" "
4870 GOSUB 2310:LOCATE 10,23:PRINT" "
4880 GOSUB 2310:LOCATE 10,23:PRINT" "
4890 GOSUB 2310:LOCATE 10,23:PRINT" "
4900 GOSUB 2310:LOCATE 10,23:PRINT" "
4910 GOSUB 2310:LOCATE 10,23:PRINT" "
4920 GOSUB 2310:LOCATE 10,23:PRINT" "
4930 GOSUB 2310:LOCATE 10,23:PRINT" "
4940 GOSUB 2310:LOCATE 10,23:PRINT" "
4950 GOSUB 2310:LOCATE 10,23:PRINT" "
4960 GOSUB 2310:LOCATE 10,23:PRINT" "
4970 GOSUB 2310:LOCATE 10,23:PRINT" "
4980 GOSUB 2310:LOCATE 10,23:PRINT" "
4990 GOSUB 2310:LOCATE 10,23:PRINT" "
5000 GOSUB 2310:LOCATE 10,23:PRINT" "
5010 GOSUB 2310:LOCATE 10,23:PRINT" "
5020 GOSUB 2310:LOCATE 10,23:PRINT" "
5030 GOSUB 2310:LOCATE 10,23:PRINT" "
5040 GOSUB 2310:LOCATE 10,23:PRINT" "
5050 GOSUB 2310:LOCATE 10,23:PRINT" "
5060 GOSUB 2310:LOCATE 10,23:PRINT" "
5070 GOSUB 2310:LOCATE 10,23:PRINT" "
5080 GOSUB 2310:LOCATE 10,23:PRINT" "
5090 GOSUB 2310:LOCATE 10,23:PRINT" "
5100 GOSUB 2310:LOCATE 10,23:PRINT" "
5110 GOSUB 2310:LOCATE 10,23:PRINT" "
5120 GOSUB 2310:LOCATE 10,23:PRINT" "
5130 GOSUB 2310:LOCATE 10,23:PRINT" "
5140 GOSUB 2310:LOCATE 10,23:PRINT" "
5150 GOSUB 2310:LOCATE 10,23:PRINT" "
5160 GOSUB 2310:LOCATE 10,23:PRINT" "
5170 GOSUB 2310:LOCATE 10,23:PRINT" "
5180 GOSUB 2310:LOCATE 10,23:PRINT" "
5190 GOSUB 2310:LOCATE 10,23:PRINT" "
5200 GOSUB 2310:LOCATE 10,23:PRINT" "
5210 GOSUB 2310:LOCATE 10,23:PRINT" "
5220 GOSUB 2310:LOCATE 10,23:PRINT" "
5230 GOSUB 2310:LOCATE 10,23:PRINT" "
5240 GOSUB 2310:LOCATE 10,23:PRINT" "
5250 GOSUB 2310:LOCATE 10,23:PRINT" "
5260 GOSUB 2310:LOCATE 10,23:PRINT" "
5270 GOSUB 2310:LOCATE 10,23:PRINT" "
5280 GOSUB 2310:LOCATE 10,23:PRINT" "
5290 GOSUB 2310:LOCATE 10,23:PRINT" "
5300 GOSUB 2310:LOCATE 10,23:PRINT" "
5310 GOSUB 2310:LOCATE 10,23:PRINT" "
5320 GOSUB 2310:LOCATE 10,23:PRINT" "
5330 GOSUB 2310:LOCATE 10,23:PRINT" "
5340 GOSUB 2310:LOCATE 10,23:PRINT" "
5350 GOSUB 2310:LOCATE 10,23:PRINT" "
5360 GOSUB 2310:LOCATE 10,23:PRINT" "
5370 GOSUB 2310:LOCATE 10,23:PRINT" "
5380 GOSUB 2310:LOCATE 10,23:PRINT" "
5390 GOSUB 2310:LOCATE 10,23:PRINT" "
5400 GOSUB 2310:LOCATE 10,23:PRINT" "
5410 GOSUB 2310:LOCATE 10,23:PRINT" "
5420 GOSUB 2310:LOCATE 10,23:PRINT" "
5430 GOSUB 2310:LOCATE 10,23:PRINT" "
5440 GOSUB 2310:LOCATE 10,23:PRINT" "
5450 GOSUB 2310:LOCATE 10,23:PRINT" "
5460 GOSUB 2310:LOCATE 10,23:PRINT" "
5470 GOSUB 2310:LOCATE 10,23:PRINT" "
5480 GOSUB 2310:LOCATE 10,23:PRINT" "
5490 GOSUB 2310:LOCATE 10,23:PRINT" "
5500 GOSUB 2310:LOCATE 10,23:PRINT" "
5510 GOSUB 2310:LOCATE 10,23:PRINT" "
5520 GOSUB 2310:LOCATE 10,23:PRINT" "
5530 GOSUB 2310:LOCATE 10,23:PRINT" "
5540 GOSUB 2310:LOCATE 10,23:PRINT" "
5550 GOSUB 2310:LOCATE 10,23:PRINT" "
5560 GOSUB 2310:LOCATE 10,23:PRINT" "
5570 GOSUB 2310:LOCATE 10,23:PRINT" "
5580 GOSUB 2310:LOCATE 10,23:PRINT" "
5590 GOSUB 2310:LOCATE 10,23:PRINT" "
5600 GOSUB 2310:LOCATE 10,23:PRINT" "
5610 GOSUB 2310:LOCATE 10,23:PRINT" "
5620 GOSUB 2310:LOCATE 10,23:PRINT" "
5630 GOSUB 2310:LOCATE 10,23:PRINT" "
5640 GOSUB 2310:LOCATE 10,23:PRINT" "
5650 GOSUB 2310:LOCATE 10,23:PRINT" "
5660 GOSUB 2310:LOCATE 10,23:PRINT" "
5670 GOSUB 2310:LOCATE 10,23:PRINT" "
5680 GOSUB 2310:LOCATE 10,23:PRINT" "
5690 GOSUB 2310:LOCATE 10,23:PRINT" "
5700 GOSUB 2310:LOCATE 10,23:PRINT" "
5710 GOS
```

```

1900 INPUT #9, J
1910 FOR x=1 TO J:FOR b=1 TO Y
1920 INPUT #9, dat(b,b)
1930 NEXT: NEXT
1940 GOSUB 2310: LOCATE 5,23: PRINT "Please Wait"
1950 CLOSE IN
1960 flag:=GOTO 740
1970 GOSUB 2310: LOCATE 8,23: PRINT "Do You Wish To Begin A New Data File
(Y or N) " : i:=1: GOSUB 2150: a:=UPPER(a)
1980 IF a="N" THEN ERASE F: GOTO 740 ELSE IF a="Y" THEN GOSUB 2010: GOTO 740
1990 PRINT CHR$(7): GOTO 1970
2000 "***** Start A New Data File *****"
2010 J:=1: i:=0: GOSUB 2350: FOR k=1 TO free
2020 LOCATE 5,2: PRINT "Free Space = " ; free ; " Records"
2030 LOCATE 5,4: PRINT " " ; " : FOR x=1 TO Y: LOCATE 22, (x+5): i:=VAL(LEFT
$(1910,2)): GOSUB 2150
2040 dat(x,2): i:=i+1
2050 GOSUB 2310: LOCATE 10,25: PRINT "Quit, (C)ontinue or (A)bandon " ; i
:=1: GOSUB 2150: a:=UPPER(a)
2060 IF a="Q" THEN flag:=GOTO 740 ELSE IF a="C" THEN 2080 ELSE IF a="A"
" : i:=i+1
2070 PRINT CHR$(7): GOTO 2050
2080 FOR b=1 TO Y: LOCATE 22, (b+5): PRINT STRING$(VAL(1910,2)), 4
b: i:=i+1
2090 J:=J+1: free:=free-i: i:=i+1
2100 GOSUB 2310: LOCATE 20,23: PRINT "Assigned Field No. " ; i:=2: GOSUB 2150
2110 b:=VAL(a): IF a=0 OR b>Y THEN PRINT CHR$(7): GOTO 2100
2120 LOCATE 22, (b+5): i:=VAL(LEFT$(1910,2)): GOSUB 2150

```

```

2130 dat(i,b): i:=i+1: GOTO 2050
2140 "***** Keyboard Input Routine *****"
2150 FOR f=1 TO L:PRINT CHR$(140); NEXT: FOR f=1 TO L:PRINT CHR$(10); NEXT
2160 i:=1: i:=i+1: PRINT CHR$(124); CHR$(42); CHR$(24); CHR$(8);
2170 IF i="*" THEN 2160
2180 Y:=ASC(i)
2190 IF P=1 AND V=127 THEN PRINT CHR$(7): GOTO 2160
2200 IF P=1 AND V=127 THEN PRINT CHR$(8); CHR$(42); CHR$(8);
2210 IF P=1 AND V=127 THEN F:=P: i:=i+1: P:=1: i:=i+1: RETURN
2220 IF V=13 THEN PRINT SPACE$(1+3)-P: i:=i+1: RETURN
2230 IF V=44 THEN PRINT CHR$(7): i:=i+1: GOTO 2250
2240 IF V=31 AND V=123 THEN GOTO 2250 ELSE PRINT CHR$(7): GOTO 2160
2250 IF P=1 THEN PRINT CHR$(7): GOTO 2160
2260 MID$(F,P,1)=CHR$(V): PRINT CHR$(V); CHR$(42); CHR$(8);
2270 IF B=0: i:=i+1 THEN P:=P+1
2280 IF P=0: i:=1 THEN PRINT " : CHR$(8);
2290 GOTO 2160
2300 "***** Clear Prompt Line *****"
2310 LOCATE 1,25:PRINT: RETURN
2320 "***** Print 58 In Centre Of Screen Line *****"
2330 PRINT TAB(115/2): i:=i+1
2340 "***** Calculate Number Of Free Records *****"
2350 free:=0: FOR x=1 TO Y: i:=VAL(LEFT$(1910,2)): i:=i+1
2360 free:=free-i: i:=i+1
2370 IF free>52767 THEN free:=5000
2380 DIM dat(free, Y): RETURN
2390 IF free=0 THEN ERASE F: RESUME 1640
2400 RESUME NEXT

```

## INCENTIVE

# 1984 and MILLIONAIRE™

## 1984

A GAME OF  
GOVERNMENT MANAGEMENT



BBC  
MODEL B  
& SPECTRUM

## 1984 - A GAME OF GOVERNMENT MANAGEMENT

'Computative'

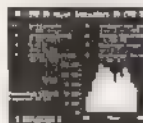
- Software Today

'Clear, Concise, and Well  
Presented'

Big K

'A very special game'

- PCW



## MILLIONAIRE

WATCH YOUR PREMISES  
GROW WITH SUCCESS!

'An absorbing program'

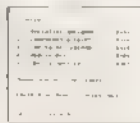
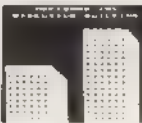
CTW

'Pick of the Week'

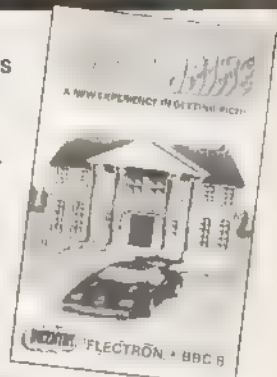
- PCW

'Very addictive...'

HCW



ELECTRON  
BBC B  
& SPECTRUM



SELECTED ITEMS AVAILABLE FROM LARGER

BRANCHES OF



John Menzies

RETAILERS 1984 and Millionaire are available now from: Microdealer,  
Tiger, Centrossoft Express, R & R, Terry Blood, Websters,  
Twang, Microdeal and Leisuresoft.

REGISTERED OFFICE 54 London Street, Reading RG1 4SQ  
CREDIT CARD ORDERS Tel: Reading (0734) 591678

ORDER FORM 1984 Spectrum £5.50 BBC B £6.50  
MILLIONAIRE Spectrum £5.50 Electron & BBC B £6.50

Please rush me the titles as indicated above by 1st Class post. I enclose  
cheque for £..... or debit my credit card

No.

Access

Name

Visa

Address

INCENTIVE SOFTWARE LTD, 54 London Street, Reading RG1 4SQ, England





# Seeing is believing

See the pack – see the screen – see the game.  
See the difference the moment you pick up one  
of the games from Firebird's new Silver Range.

The difference is that our packs show the high  
quality you'll see on the screen when you play,  
so you know exactly what you're buying.

The same high standard applies to all twenty  
games in the range and all are available at the  
remarkably low price

**£2.50**

## FIREBIRD

SOFTWARE

Here's a sneak look at three of the NEW games:



### TERRA FORCE

Terra Man defends the earth against  
Ygothulu and his marauding hordes  
of Demon Bombers and Solar Pods.



### MR FREEZE

Six freezer compartments to de-ice,  
each packed with chilling obstacles,  
and each tougher than the last.



### HEADACHE

Nervous Ned versus Head Banger in  
a furious quest to carry messages  
to the brain.

Look out for these games in the FIREBIRD silver range at selected high street stores.

SPECTRUM: THE WILD BUNCH BOOTY MR FREEZE TERRA FORCE VIKING RAIDERS MENACE EXODUS RUN BABY RUN CRAZY CAVERNS BYTE BITTEN VIC 20: SNAKE BITE MICKEY THE BRICKY.  
COMMODORE 64: BOOTY MR FREEZE EXODUS HEADACHE ZULU GOGO THE GHOST BBC MICRO: BIRD STRIKE GOLD DIGGER ACID DROPS DUCK! ESTRA THE HACKER

The new range from British Telecom.



You'd better believe it!!!

FIREBIRD SOFTWARE, WELLINGTON HOUSE, UPPER ST. MARTIN'S LANE, LONDON WC2H 9DL TEL: 01-379 6755/5626



# Particle projection — mind your manners

Plot your flights of fancy with *Projectile* by P. Whitehurst

I wrote this program to visualise how a particle behaves when projected at different velocities and different angles. The resulting program is suitable for a BBC Model A or B, or an Electron, as it utilises mode 4 graphics.

When run, the program asks you first for the velocity of projection, and then for the angle the particle is to be projected at. A graphical representation of its path is then

drawn, with both axes labelled in metres.

After plotting its path, the program asks if you would like to replot the path of a particle with different angle and velocity, or plot the path of the new particle over that of the old. Thus the paths of various different particles may easily be compared with each other.

The program does not make use of procedures, as such things would be consi-

dered to be overkill on the part of the programmer in such a straightforward program.

### Program Notes

Lines 10-50 set up Mode 4; input lines for velocity and angle are included, with full error checking.

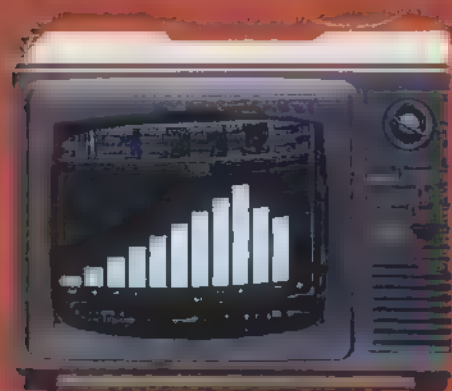
Lines 60-90 set up the screen, the scales being drawn in metres, and the variables for vertical and horizontal distance and velocity are set up. The direction of velocity is represented in lines 150 & 160 as an arrow pointing in the direction of projection.

Lines 200-250 plot the path of the particle. The factor of 1/10th in each of the lines regarding a change in distance or velocity is to ensure that an accurate plot is obtained.

Lines 260-280 select whether a superimposed image or a complete replot of the drawing is required.

```
10MODE4
20"BU.B.0.4.57.0
30PRINT"Simulation of the path of a particle projected with velocity v m/s
& at angles degrees from a point O."
40INPUT"Velocity of projection,(1-100m/s)",v:IFV<1ORV>100THENPRINT"Error!":
GOTO40
```

# For a better image



The Sinclair QL gives you the best in micro technology. So why entrust it to a screen that cannot match this?

A blurred, incomplete or fuzzy image can ruin even the best program. Not to mention the strain it may put on your eyes.

Now, we can offer you the monitor to match the micro.

The Prism QL14 colour monitor has been designed to meet the exact needs of the QL.

It gives you clear, pin-sharp graphic images, and the ability to display the full 85 column text available on the QL.

And the light-weight Prism QL14 is fully portable, incorporating a retractable handle and is provided with the necessary connecting cable.

# PRISM

```

50 INPUT "Angle of projection, A(0-89deg)"; A: IF A=0 OR A=89 THEN PRINT "Error!": GOTO 5
60 VDU29,80,100,5
70 MOVE 110,0: DRAW0,0: DRAW0,650: MOVE 120,630: DRAW0,650: DRAW20,630: MOVE 1100,-20:
DRAW 1120,0: DRAW 1100,20
80% 0: FOR F=0 TO 1000 STEP 100: MOVE F,-10: DRAW F,10: MOVE F,-20: PRINT F/100: NEXT
90 FOR L=0 TO 600 STEP 100: MOVE -10,F: DRAW 10,F: MOVE -40,1: PRINT F/100: NEXT
100 MOVE 180,-50: PRINT "Horizontal distance (*100m)"
110 MOVE 0,750: PRINT "Height" (*100m)
120 VDU29,0,0,1279,000
130 dist=0: height=0
140 IFAD=0
150 MOVE 0,0: DRAW 200*COS(A),200*SIN(A)
160 MOVE 180*COS(A)+130,180*SIN(A)+PI/32: DRAW 200*COS(A),200*SIN(A): DRAW 180*COS
(A-PI/32),180*SIN(A-PI/32)
170 PLOT 0,20,60: PRINT "V": MOVE 0,0
180 vert vel=y*SIN(A): hor vel=x*COS(A)
190 VDU4
200 RPLCL
210 DRAW dist,height
220 dist=dist+hor vel/10
230 height=height+vert vel/10
240 vert vel=vert vel-9.81/10
250 UNTIL dist>1280 OR height>0
260 VDU29,0,4,39,0,12: PRINT "Press S to superimpose-P to replot"
270 IF GET#="S" THEN VDU12: GOTO 10
280 IF GET#="P" THEN GOTO 10

```

## ..... picture this

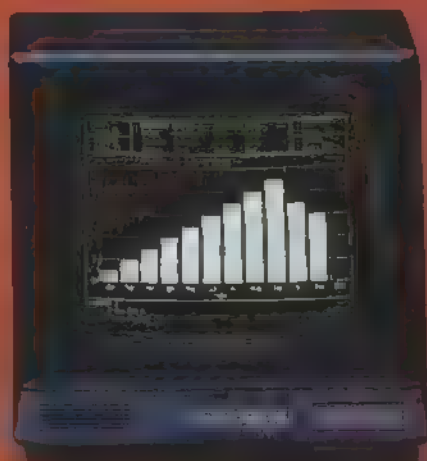
At only £199.99, the stylish QL14, finished in matt black and including a detachable anti glare glass front, ensures that you get the best from your QL.

So for a clearer picture simply speak to your local dealer.

After all, it's not only the image on your QL that's at stake.

### TECHNICAL SPECIFICATIONS

Number of columns ..... 85  
 Tube ..... 300 14" (34 cm V) self  
 ..... converging colour tube  
 Video Bandwidth ..... 12 MHz  
 Shadowmask pitch ..... 0.63 mm  
 Direct RGB input ..... 5 volt pp into 300 ohms  
 Dimensions ..... 375 mm wide x 375 mm high  
 ..... x 290 mm deep  
 Weight ..... 12 kg (26 lbs)  
 Country of origin ..... UK



**Prism Microproducts Limited**  
 Prism House, 18/29 Mora Street  
 City Road, London EC1 8HT  
 Telephone: 01-253 2277



## M.S.W.M. REVIEW

Something in it for everyone... informative, interesting, fun, educational and graphically exciting. Very well formatted.

The magazine contains such things as games, competitions, utility programs, letters from readers and amazing things you could do with your Spectrum... (in the best possible taste!).

It is very well written and an enormous amount of energy is put into each issue - (friendly magazine At £2.95 it's very reasonably priced.)

2X COMPUTING

## WITH CURRAH SPEED

## STARBOARD

The sailing dinghy racing game for up to 4 players.

48K SPECTRUM version.....£6.95  
Or as a board game.....£10.00  
Or play BOTH together.....£14.95

...fun for all the family.

**PITFALL** by TREV GLOVER

Easy to play adventure game. REALISTIC 3D. CURRAH SPEED.

48K SPECTRUM £6.95

AN IDEAL CHRISTMAS PRESENT.

## MAIL ORDER ONLY

## 48K SPECTRUM



**OTHER INFINITE SPECTRUM TITLES**  
TEN GREAT GAMES .....£7.50 0  
SOUND-LIGHT GENERATOR.....£3.99 0  
CHARACTERS SETS.....£3.99 0  
SUPRFILE 100.....£4.99 0  
STORYMAKER FOR KIDS.....£4.99 0  
H/CODE SOUND LIBRARY.....£3.99 0

*CUT THE TITLES YOU WOULD LIKE -  
- CUT OUT THIS FORM AND SEND IT  
TO US AT THIS ADDRESS: -*

SEND ORDER TO>>

INFINITE SOFTWARE  
73 ALCESTER ROAD,  
MOSELEY,  
BIRMINGHAM 13.

PLEASE SEND ME THE FOLLOWING:-  
M.S.W.M.#4.....£2.99 0  
M.S.W.M.#5.....£2.99 0  
M.S.W.M.#6.....£2.99 0  
M.S.W.M.#7.....£2.99 0  
M.S.W.M. VOL 2:1.....£2.99 0

SEND ORDER TO: -



## SPECTRUM

COMMODORE 64

GAME	RAP	OUR
	PRICE	PRICE
ROTONICS/WAFFERDRIVE	129.95	129.95
SHERLOCK HOLMES	14.99	9.99
XOKOTONWILF	5.99	4.75
PUZZLE/MACHINA	10.95	10.75
KNIGHTLORE	9.95	6.95
DARKSTAR	7.95	4.99
SABRE WOLF	9.95	6.75
DALEY THOMPSON DECATHLON	6.99	4.99
REACHHEAD	7.95	5.50
WHITE LIGHTNING	14.95	9.99
HOBBIT	14.95	9.99
LOOPS OF MIDNIGHT	9.95	5.99
PSYTRON	7.95	5.99
LOOPS OF MIDNIGHT	5.95	4.50
JEI SET WILLY	5.95	4.50
FRANK N STEIN	5.95	4.50
TORNADO LOW LEVEL	5.95	4.50
TRASHMAN	5.95	4.50
FIGHTER PILOT	7.95	5.99
NIGHT GUNNER	5.95	5.25
CLASSIC ADVENTURE	6.95	5.50
VALHALLA	14.95	9.99
MONTY MOLE	6.95	4.99
FULL THROTTLE	6.95	5.75
MATCHPOINT	7.95	5.99
AVOLON	7.95	5.50
VALHALLA	7.95	5.50
BATTLECAHS	7.95	5.99
RIVER RAID	7.95	5.50
ENDURO	7.95	5.50
HAMSTEAD	9.95	6.95
PSYTRAX	7.95	5.50
STARBIKE	6.95	4.99
GIANTS HELVING	6.95	4.99
SCHABBLE	12.95	9.99
EDGE KID JUMP CHALLENGE	6.95	4.75
COMBAT LYNX	7.95	5.50
TWIN KINGDOM VALLEY	7.95	4.99
TRAVEL WITH TRASHMAN	5.95	4.75
CODING DARKS REVENGE	9.95	5.99
HAUDC	7.95	5.25
POLTERGEIST	5.95	4.50
BACKPACKER GUIDE TO THE UNIVERSE	7.50	5.25
QUASMODOS REVENGE	6.90	4.90
RAMTANOC	6.90	4.90
AIRWOLF	6.90	5.25
PYJAMAKAMA	8.95	5.25
RAMTANOC INTERFACE	22.95	18.00
2X SPECTRUM EXPANSION SYSTEM	99.95	99.95

## GAME

GAME	RAP	OUR
	PRICE	PRICE
RAID OVER MUSCOW	9.95	7.70
PSYWARHORN	9.95	8.88
SUICIDE EXPRESS	7.95	6.50
CHOCOLATE BUSTERS	10.95	6.50
ACTIVISION ALL OTHER TITLES	9.95	7.50
JEI SET WILLY	7.90	5.75
ZIM SALA BIM	9.95	8.99
SHIP POKER	9.95	7.25
BLACK HAWK	7.95	5.50
PSYTRON 64	7.95	5.50
ASTEC	4.95	7.25
ANAH	6.95	7.25
MR ROBOT	4.95	7.25
HOBBIT	14.95	9.99
TALES OF ARABIAN NIGHTS	7.90	5.50
DALEY THOMPSON DECATHLON	7.95	5.99
BEACHHEAD	4.95	7.25
DECATHLON	3.99	7.95
MONTY MOLE	7.95	6.50
SOLO FLIGHT	14.95	11.00
TRASHMAN 64	7.95	6.50
VALHALLA	14.95	10.99
DEATH STAR INTERCEPTOR	9.95	8.50
PITFALL II	9.95	7.50
RIVER RAID	9.95	7.50
HERO	9.95	7.50
BRUCE LEE	9.95	7.50
NATO COMMANDER	9.95	7.25
SHIP THE ACE	9.95	7.25
EDDIE KID JUMP CHALLENGE	7.95	5.50
STUNT BIKE	6.90	4.99
MY CHESS II	8.95	7.25
BATTLE FOR MIDWAY	9.95	6.99
HAUDC	9.95	7.95
ANGRIAL	7.50	5.50
QUASMODOS REVENGE	1.90	5.90
FORWARD LOW LEVEL	7.90	5.90
JONY AND THE JIMPS	6.90	5.25
KOKO TONI WILF	6.90	5.25
ZAXXON	9.95	7.25
THE APOCALYPSE	9.95	7.25
SUMMER GAMES	14.95	10.50
DOD VADIS	9.95	7.25
SHERLOCK HOLMES	14.95	10.50
CHART BUSTERS	9.95	7.50
COMBAT LYNX	8.95	7.25
PITFALL I	9.99	7.50

## SPECIAL OFFER

GAME	RAP	OUR
	PRICE	PRICE
SPECTRUM 64	9.95	6.95
SOFTWARE PACKAGE WORTH		50.00
ALUMINUM LOCK (48K)		14.95
ADDRESS BOOK (48K)		11.95
TOTAL VALUE		222.95
OUR OFFER		134.90

(This offer is not included in the  
£5.00 discount for orders over £50)

## BBC GAMES

GAME	RAP	OUR
	PRICE	PRICE
OLD FATHER TIME	9.50	7.50
CITY OFFENCE	7.50	5.95
MUSIC SYNTHESIZER	9.50	7.50
TWIN KINGDOM VALLEY	8.50	7.50
MURK	7.95	6.50
AVATAR	14.95	11.00
BLAGGER	7.95	6.95
JOE DIGGER	9.95	8.50
HOBBIT	14.95	9.99
WOLFGANG CASTLE	9.95	8.50
CHARTBUSTER	9.95	7.50
ELITE	14.95	10.50

## ELECTRON GAMES

GAME	RAP	OUR
	PRICE	PRICE
MICRO OLYMPICS	5.95	4.75
TWIN KINGDOM VALLEY	9.50	7.50
MURK	7.95	6.50
ALL ABOUT IT	9.95	7.50
CHUCKIE EGG	7.95	6.50
BLAGGER	7.95	6.50

## ALL PRICES INCLUDE P&P

QUICKSHOT II ONLY £8.99

PLEASE NOTE IF YOUR ORDER

EXCEEDS £50 YOU GET

10% FURTHER DISCOUNT

SEND CHEQUES/P.O. TO

GOODBYE PCW10

94 LEATHER LANE, LONDON EC1

PLEASE STATE WHICH MICRO





We are always actively seeking programs for publication — either for Open Forum, the machine pages or Star Game. When sending in a program for consideration, a clear program listing should be sent, together with, wherever possible, a saved copy on cassette. Documentation — usually not more than 1000 words — should start with a general description of the program, what it does, and then some detail of how the program itself is constructed. We pay very competitive rates, according to the length and nature of the program and the quality of the accompanying documentation.

## Scrolling

### on Spectrum

Innumerable scrolling routines have been published, many of them for the Spectrum. This one probably is the best in terms of

memory consumption and speed: the program scrolls the whole screen left or right four pixels in just 38 bytes (19 bytes for each routine). The code itself is position-independent, but when using the Basic loader (see listing), the screen is scrolled left using *Randomise Usr 64000* and right using *Randomise Usr 64020*.

The secret of the routines' shortness is the use of the much underused BCD rotation instructions in the Z80's instruction set: RLD and RRD. In effect, the routine treats each line of the screen as a 32 byte long BCD number and rotates it left or right, hence appearing to move the line left or right by 4 pixels.

```
10 REM *****
20 REM * BASIC Loader *
30 REM * For Left/Right *
40 REM * Pixel scrolling *
50 REM *
60 REM * By H.C.Derels *
70 REM *****
80 CLEAR 63999
90 FOR F=64000 TO 64037 READ
100 POKE F, NEXT F
110 DATA 243,33,223,37,14,191,6
120 DATA 237,111,43,15,251,13,32
130 DATA 243,33,223,37,14,191,6
140 DATA 237,111,43,15,251,13,32
150 DATA 243,33,223,37,14,191,6
160 DATA 237,111,43,15,251,13,32
170 DATA 243,33,223,37,14,191,6
180 DATA 237,111,43,15,251,13,32
190 DATA 243,33,223,37,14,191,6
200 DATA 237,111,43,15,251,13,32
```

```
10 REM *****
20 REM * BASIC Loader *
30 REM * For Left/Right *
40 REM * Pixel scrolling *
50 REM *
60 REM * By H.C.Derels *
70 REM *****
80 CLEAR 63999
90 FOR F=64000 TO 64037 READ
100 POKE F, NEXT F
110 DATA 243,33,223,37,14,191,6
120 DATA 237,111,43,15,251,13,32
130 DATA 243,33,223,37,14,191,6
140 DATA 237,111,43,15,251,13,32
150 DATA 243,33,223,37,14,191,6
160 DATA 237,111,43,15,251,13,32
170 DATA 243,33,223,37,14,191,6
180 DATA 237,111,43,15,251,13,32
190 DATA 243,33,223,37,14,191,6
200 DATA 237,111,43,15,251,13,32
```

## Arcade Avenue



### No sprites

Elite is by any accounts a major piece of programming. By combining its talent for arcade programming and its intellectual aspirations, Acornsoft has produced a game that must pass as the closest simulation of what the space age could look like that we have yet seen on a micro.

For those that don't know it is a kind of cross between a Kingdom strategy game, *Barbarians*, and a fully three-dimensional flight simulator (I know all flight simulators are supposed to be 3D but in space you can fly at any angle you chose without worrying about a premature rendezvous with the ground). Unfortunately, it has confirmed a suspicion that

have long had that real space flight, and especially space combat, is so complex, disorientating and frustrating that it's best left to the battle computers whilst we humans get on with playing *Galaxion*.

Anyway, for those with greater mental capacity and determination here is a tip that was passed on to me by one of our reviewers on how to dock with the space station. Find the point 'S' that is halfway on the line between the planet and the station. Rotate to make the line horizontal and cut engines when the station is square with the side window. Then rotate 90°, adjust point directly at the station, and rotate till the station is fixed like rectangle in view. I hope that means more to Beeb owners than it does to me.

One of the most popular games of recent years amongst some of the PCW staff was Crystal's (now Design-Design Software) *Halls of the Things*. Personally, I have to agree with Tony Bridge's high estimation of this game because although it is now looking a bit dated

graphically, I must rate it as the most lasting game in my collection in terms of addictivity.

The good news is that it has now been released for the CBM with the addition of a little sound and the welcome option of user defined keys and joystick control. Otherwise, the game is an almost exact copy of the Spectrum original, even down to the simulated Spectrum loading screen. An Amstrad version is also underway.

Design-Design have also made a selling point of the fact that their new game, *Dark Star* has no sprites. Their contention is that sprite-based machines like the MSX range are limited in their graphic capabilities by this hardware commitment. The company has preferred to concentrate on writing software, like *Halls*, where the programming effort has concentrate on writing software, like *Halls*, where the

*Dark Star* is therefore completely devoid of cute shapes with names like Rotten Ron and Berkly Bill, but rather

a 'vector graphics' space game where you are faced with an interstellar flight of breathtaking speed worthy of a place in any alien basher's collection. The concept of user defined keys has also been stretched to its limit with most keys definable to perform any game function, or combination of functions that you may wish.

Finally, for those who think horrendous spelling gaffes are the prerogative of Tony Bridge's adventure games take a look at the adverts for Software Project's new game *Heebie jeebies* where "you play the roll of a spider". In next week's column I will be playing the sandwich of a centipede.

**Tony Kendle**

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments from playing tips on difficult games or programs you particularly like to praise (or blame!) then write to Tony Kendle, Arcade Avenue Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD

```

00010 Left and right
scroller
00020 :in medium
resolution (4 pixels)
00030
00040 :I LEFT SCROLL )
00050
00060 org 54000
00070
00080 lscrol ld hl,22485
00090 ld c,191
00100 ld b,32
00110
00120
00130
00140
00150
00160
00170 :I RIGHT SCROLL )
00180
00190 rscrol ld hl,16384
00200 ld c,191
00210
00220
00230
00240
00250
00260
00270
00280
00290
00300
00310
00320
00330
00340
00350
00360
00370
00380
00390
00400
00410
00420
00430
00440
00450
00460
00470
00480
00490
00500
00510
00520
00530
00540
00550
00560
00570
00580
00590
00600
00610
00620
00630
00640
00650
00660
00670
00680
00690
00700
00710
00720
00730
00740
00750
00760
00770
00780
00790
00800
00810
00820
00830
00840
00850
00860
00870
00880
00890
00900
00910
00920
00930
00940
00950
00960
00970
00980
00990

```

Scrolling  
by H Dereli

## Retrieve

on CBM 64

This simple program will let you 'unnew' your newed basic program. Before you start typing in any magazine listings etc. Load

and Run the program.

Now type in New and enter in your listing normally. If by accident you do type in New while entering in your listing, follow out Step 5.

To test out the memory retrieve program do the following:

- 1 Load and Run the memory retrieve program.
- 2 Type in New
- 3 Load in a Basic program and List
- 4 Now type in New and then List
- 5 Now type in SYS50000 to retrieve your original program.

```

10 FORT=21000
20 READ AB
30 POKE 21000+AB
40 NEXT TC
45 IF A<>255 THEN PRINT DATA
50 ERROR : EN

```

```

52 DATA169.8.160.1.145.43
62 DATA32.71.165.165.34
72 DATA133.145.133.42.133
82 DATA49.165.35.133.46
92 DATA133.148.133.50.96

```

Retrieve  
by S Sindhar

## Microradio

GW6JJN



### Packet Radio

To many of us, Packet Radio still seems the best bet in Radio Computing. It is a form of communication that is used in Amateur Radio in Canada and the United States, and slowly, becoming more popular in the United Kingdom.

The reason for the rise in interest here is manifold. It means that many users can use the same radio frequency simultaneously; it means that data can be sent accurately and surely even in the most difficult conditions, and it is about 20 times faster than RTTY and AMTOR. When a network of intelligent terminals are set up, data can be routed from node

node with extremely high integrity.

One example of the rising interest is a letter to Microradio from Trevor Tugwell G6TJT of Stevenage, Herts. Trevor writes in to say that several people in the Hertfordshire area have been active on Packet Radio since the beginning of the year, experimenting with various protocols. They have finally settled by standardising on a program written by Peter Robinson G6CX for the BBC Model B.

This program has proved popular mainly because of the ease with which it can be implemented, not requiring any modems or interfaces and all input and output is via the cassette port.

The program has limitations such as the low baud rate of 300 baud, but it works effectively. To this end there is a regular Packet Radio net every Monday evening at 8pm on 144.675MHz which covers the Herts, Beds and North London areas. This particular frequency

has developed as the regular packet frequency in the area and the program is spreading across the country as other local Packet groups develop.

In addition, local amateurs have been experimenting with the Amateur Packet Standard AX.25 which they have running at around 1200 baud with very good results. Already they are capable of running five or six simultaneous independent contacts on the same frequency channel.

It is this economy of spectrum space that is the great appeal of Packet Radio on the crowded amateur bands. The AX.25 protocol is implemented by the use of a separate board with its own microprocessor. Ram and Rom and has the obvious advantage that it can be run on any micro that has a serial RS232 port. The microcomputer in fact acts just as a dumb terminal running a program capable of sending ASCII information through its serial port.

Thanks to Trevor and I would be very grateful to anyone else who can update this report with news of other Packet groups. I would very much like to see a circuit diagram or a prototype of the terminal board, so if you have any information, please write in to the column.

Microradio has promoted the idea of Packet in the UK as the best solution to error-free communication by computers in radio and I am glad to pass on any information that might help to advance the possibilities that Packet Radio offers. Trevor Tugwell can be reached at 11 The Dell, Stevenage, Herts SG1 1PH.

Ray Berry GW6JJN

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share, or topics that you would like to see covered, write Ray Berry Microradio, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

# Open Forum

## UFO Attack

on Vic 20

**UFO Attack** is an interesting game for the unexpanded Vic 20 the object of the game is to destroy as many of the UFOs as possible within the two minute time limit. You are in control of a destroyer based on earth and

attack the UFOs with missiles.

### Program Notes

Lines 1-20 Set up variables  
Lines 21 to 80 Main program loop  
Lines 81 to 103 Instructions

```

1: FOR I=0 TO 1
2: GOTO 1
3: PRINT "UFO ATTACK"
4: FOR I=0 TO 1
5: DEFEND "UFO ATTACK"
6: DEFEND "UFO ATTACK"
7: DEFEND "UFO ATTACK"
8: PRINT "UFO ATTACK"
9: DEFEND "UFO ATTACK"
10: DEFEND "UFO ATTACK"
11: DEFEND "UFO ATTACK"
12: DEFEND "UFO ATTACK"
13: DEFEND "UFO ATTACK"
14: DEFEND "UFO ATTACK"
15: DEFEND "UFO ATTACK"
16: DEFEND "UFO ATTACK"
17: DEFEND "UFO ATTACK"
18: DEFEND "UFO ATTACK"
19: DEFEND "UFO ATTACK"
20: DEFEND "UFO ATTACK"
21: DEFEND "UFO ATTACK"
22: DEFEND "UFO ATTACK"
23: DEFEND "UFO ATTACK"
24: DEFEND "UFO ATTACK"
25: DEFEND "UFO ATTACK"
26: DEFEND "UFO ATTACK"
27: DEFEND "UFO ATTACK"
28: DEFEND "UFO ATTACK"
29: DEFEND "UFO ATTACK"
30: DEFEND "UFO ATTACK"
31: DEFEND "UFO ATTACK"
32: DEFEND "UFO ATTACK"
33: DEFEND "UFO ATTACK"
34: DEFEND "UFO ATTACK"
35: DEFEND "UFO ATTACK"
36: DEFEND "UFO ATTACK"
37: DEFEND "UFO ATTACK"
38: DEFEND "UFO ATTACK"
39: DEFEND "UFO ATTACK"
40: DEFEND "UFO ATTACK"
41: DEFEND "UFO ATTACK"
42: DEFEND "UFO ATTACK"
43: DEFEND "UFO ATTACK"
44: DEFEND "UFO ATTACK"
45: DEFEND "UFO ATTACK"
46: DEFEND "UFO ATTACK"
47: DEFEND "UFO ATTACK"
48: DEFEND "UFO ATTACK"
49: DEFEND "UFO ATTACK"
50: DEFEND "UFO ATTACK"
51: DEFEND "UFO ATTACK"
52: DEFEND "UFO ATTACK"
53: DEFEND "UFO ATTACK"
54: DEFEND "UFO ATTACK"
55: DEFEND "UFO ATTACK"
56: DEFEND "UFO ATTACK"
57: DEFEND "UFO ATTACK"
58: DEFEND "UFO ATTACK"
59: DEFEND "UFO ATTACK"
60: DEFEND "UFO ATTACK"
61: DEFEND "UFO ATTACK"
62: DEFEND "UFO ATTACK"
63: DEFEND "UFO ATTACK"
64: DEFEND "UFO ATTACK"
65: DEFEND "UFO ATTACK"
66: DEFEND "UFO ATTACK"
67: DEFEND "UFO ATTACK"
68: DEFEND "UFO ATTACK"
69: DEFEND "UFO ATTACK"
70: DEFEND "UFO ATTACK"
71: DEFEND "UFO ATTACK"
72: DEFEND "UFO ATTACK"
73: DEFEND "UFO ATTACK"
74: DEFEND "UFO ATTACK"
75: DEFEND "UFO ATTACK"
76: DEFEND "UFO ATTACK"
77: DEFEND "UFO ATTACK"
78: DEFEND "UFO ATTACK"
79: DEFEND "UFO ATTACK"
80: DEFEND "UFO ATTACK"
81: DEFEND "UFO ATTACK"
82: DEFEND "UFO ATTACK"
83: DEFEND "UFO ATTACK"
84: DEFEND "UFO ATTACK"
85: DEFEND "UFO ATTACK"
86: DEFEND "UFO ATTACK"
87: DEFEND "UFO ATTACK"
88: DEFEND "UFO ATTACK"
89: DEFEND "UFO ATTACK"
90: DEFEND "UFO ATTACK"
91: DEFEND "UFO ATTACK"
92: DEFEND "UFO ATTACK"
93: DEFEND "UFO ATTACK"
94: DEFEND "UFO ATTACK"
95: DEFEND "UFO ATTACK"
96: DEFEND "UFO ATTACK"
97: DEFEND "UFO ATTACK"
98: DEFEND "UFO ATTACK"
99: DEFEND "UFO ATTACK"
100: DEFEND "UFO ATTACK"
101: DEFEND "UFO ATTACK"
102: DEFEND "UFO ATTACK"
103: DEFEND "UFO ATTACK"

```

**UFO Attack**  
by M O Keele

## Baud Walk



### Price war

**W**ell, the price battle over the modems as forecast has really set the database world alight. Enter Unicom, the all-singing, all-dancing modem for hobbyists at a neat £57, although don't forget that the software to operate it costs another £20.

Unicom reckoned that if other modem manufacturers claimed 2000 sales a month, then they must be making fat profits. Well, I would love to get hold of a Unicom — they've promised to send me one — so that I can see exactly what components are inside and how they've managed to build it for around £35, assuming the price isn't there because they love us baud walkers.

Unicom say they have only used existing components and the modem is assembled by a number of different companies in the UK. It revolves around the AMD 9810 chip which I happen to know costs £13 — if you order a million off! Whatever, it's got to be great news.

Modems offering similar capabilities currently sell for around £125 plus.

Software for the BBC micro is coming first, followed apparently by Commodore 64 and Spectrum, although the Spectrum's lack of an RS232 port may inhibit matters. Apparently the Unicom is at the moment in for BT approval which takes anything from three to six months so I'm reserving my judgement until I've actually used it. Write to 20 Orange Street, London WC2 for more details.

Another sign of the times — the Prism VTX5000 modem which carries on-board software for the Spectrum is now appearing in some places at

only £69.95 having dropped from £99.95 and again from £79.95 in some stores. The modem is 1200/75 1200/1200 baud and has user-to-user software as well as Micronet 800/viewdata software. Call 01-253 2277 for details.

**Robin Wilkinson**

**Baud Walk** is a new weekly column with news on networking, databases, reviews of modems and software and points of contact for information.

Any readers with experience of networking are asked to send their experiences or news of services to Robin Wilkinson, Baud Walk Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

He can also be contacted on Prestel mailbox 019953727.



## "CADCAM WARRIOR"

"Who?"

"CADCAM WARRIOR,  
it's got over 8,000 screens!"

"WHAT!!!"

"CADCAM WARRIOR.  
The unique 3-D arcade concept."

"B\*\*ocks."

"CADCAM WARRIOR!  
See for yourself."

"When?"

"CADCAM WARRIOR.  
Out now from TASKSET."

"Great!"



### THE MOORS CHALLENGE

£6.95

An ancient game of strategy and cunning. 'Capture' all your opponents counters to win. Play against your Amstrad CPC 464 at any of five skill levels, from simple to advanced or play against a friend, you can even make the computer play against itself.

### THE ROYAL QUEST

£6.95

Can you discover the object of your quest and then complete it? A classic text only adventure, with dozens of problems to

keep you perplexed for weeks. Features include save game facility and very large vocabulary.

### ROLLABALL

£6.95

A challenging game of skill, relying on quick wits and steady nerves. Can you keep the ROLLABALL in motion?

All you have to do is slide a piece of track in its path to divert it, trouble is the tracks always disappear when the ROLLABALL moves over them. A very addictive one player game.

### ★ ★ ★ SPECIAL OFFER ★ ★ ★

For a limited period only\* Timeslip Software will be giving away one free title with every two titles purchased, so hurry send cheque/P.O.'s payable to...

#### TIMESLIP SOFTWARE

STONEBURN WORKSHOPS  
THE OLD PRIMARY SCHOOL  
STONEBURN, WEST LOTHIAN EH47 8AP

\*Offer ends 31st November 1984

You haven't lived until  
you've died in

# MUD

"I'll admit to  
being hooked"  
POPULAR  
COMPUTING  
WEEKLY

"MUD leaves other  
adventures for dead"  
PERSONAL COMPUTER  
WORLD

"'Normal' adventure games will never  
be the same again" BIG K

From Century Communications Ltd

Now available on  
**CompuNet**

**CENTURY**

# TURBO CHARGE YOUR SPECTRUM



## Outperforms any Spectrum interface

The unique Turbo interface from Ram gives you all these features – and more – in one unit:

- \* A variety of interfaces including: Rom cartridges, two 9-way D plugs for standard joysticks, PLUS full expansion bus at rear.
- \* Compatible with Kempston and Protek protocols.
- \* Works with latest Quickshot Mk II auto rapid-fire joysticks!
- \* Choice of Rom cartridge or tape cassette software.
- \* Instant program loading with cartridge software.
- \* Built-in power safety device – unique Ram Turbo.
- \* Full one year guarantee.
- \* Immediate availability – 24 Hr despatch on receipt of P.O./credit card details (cheques – seven days).
- \* Incredible value – only £22.95.

So don't wait around – simply complete the coupon and send it to us today.

Or call our credit card hot line on 02514 25252. (Access and Visa welcome).

Ram Electronics (Fleet) Ltd, 106 Fleet Road, Fleet, Hampshire GU13 8PA.

Please send me:

\_\_\_\_\_ Spectrum Turbo Interface(s) at £22.95  
+ £1 p + p (overseas orders £3 p + p)

\_\_\_\_\_ Quickshot II Joystick(s) at £9.95

(Only when purchased with Turbo – normally £12.95 + £1 p + p)

I enclose cheque/postal order or charge my Access/Visa for: £ \_\_\_\_\_



Name \_\_\_\_\_

Address \_\_\_\_\_

Tel \_\_\_\_\_

To Ram Electronics (Fleet) Ltd, 106 Fleet Road, Fleet, Hampshire GU13 8PA.

24 Hr  
despatch for  
credit cards and  
postal orders



Trade and export enquiries welcome.

# Open Forum

## Fred

on Vic 20

This is a two player game for the unexpanded Vic 20. The unlikely scenario...Fred has just seen Tron on video, and has got

quite carried away. He has dug a trough around the living room and asked Edna (the wife) for a game of light cycles. Edna wasn't very pleased. Watch out for the deadly gas.

Controls: Edna — 'M' = left, 'V' = right, 'Z' = down, 'A' = up Fred — 'C' = right,

'X' = left, 'A' = up, 'Z' = down

### Program Notes

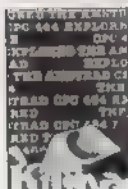
60-90 Draws border  
150-240 Checks movement  
250-350 Moves Edna and Fred  
9000-9060 Messages

```

5 POKES6376:
10 PRINT "F"
15 R=INT(RND*1)+255: IF RND*1<255:
20 POKES6379:59-POKE6380:255:POKE6381:15
30 PF=POKE6381:PF=15
40 V=1:V=1
50 D=100:R=63:G=100:20
60 POKES6381:POKE6380+1+6:POKE63800+1+6:NEXT
70 FORI=770:US=155:STEP22:FORI=193:POKEI+1+6:NEXT
80 FORI=810:US=155:STEP22:FORI=193:POKEI+1+6:NEXT
90 FORI=810:US=155:STEP22:FORI=193:POKEI+1+6:NEXT
95 POKES6381:POKE6381:2
100 POKES6381:POKE6381:4
150 GETF1:IF F1=1 THEN GOTO 150
170 IF F1="X" THEN V=-1:GOTO 1250
175 IF F1="V" THEN V=22:GOTO 1250
180 IF F1="Z" THEN V=10:GOTO 1250
210 IF F1="A" THEN R=1:GOTO 1250
220 IF F1="C" THEN R=1:GOTO 1250
230 IF F1="M" THEN R=-1:GOTO 1250
240 IF F1="A" THEN R=1:GOTO 1250

```

## Book Ends



**Book:** The Amstrad CPC464 Explored Price £7.95 Micro General Supplier Kuma Computers, 12 Horseshoe Park, Pangbourne, Berks.

All things considered there are few books on the Amstrad computer. Considering the mad rush to get QL books out, the Amstrad, which was well received and appears to be doing well, is shunned as though it has a social disease.

Kuma, who have been supporting the Amstrad with software, have now produced one of the first books for it. It is the 'general guide' style covering simple programming in Basic and toying briefly with machine code.

There are five broad sections covering basic setting up, using music, graphics, assembly language and ending with the construction and analysis of a fairly substantial home accounting program. There are other programs throughout the

book illustrating each new item.

The book is well written and thorough, although probably not as 'idiot level' as some other introductory books — no cartoon characters and colour diagrams here. Quite a good book, but fairly expensive, too.

Graham Taylor



**Book:** Creative Computer Graphics Price £15.95 Micro General Supplier Cambridge University Press, Blaking Division, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU.

Now here's a book I'd like to see stuffed into my Christmas stocking — *Creative Computer Graphics* is a large format book chock full of illustrations of graphics created by computers.

The book aims to show just what is currently being achieved in computer graphics from films like *Tron* and the

awesome-looking but as yet unfinished, *The Work* to commercial designs like the Channel Four logo.

It's a coffee table book really, rather than a serious educational tome — although the text surrounding the lavish illustrations is interesting, if not deeply analytical. Personally, I love coffee table books and this one is one of the most flickable I've seen.

Some of the pictures I've not seen before and some of the graphics are astounding, although not the sort of thing you going to see on your home micro. Not that micros are completely ignored; there is a section towards the end of the book which covers games and mentions a few favourites like *Vaihalla* and *Commodore's Soccer*. The choices are a bit random and some pictures which are evidently from Psion's QL packages are described as being on the Spectrum computer — nevertheless a brilliant Christmas present.

Graham Taylor



**Book:** Oric 1 and Atmos Price £7.95 Supplier McGraw-Hill Book Company (UK), Shoppenhangers Road, Maidenhead, Berks.

To make full use of Geoff Phillips' book you will need to know not only what machine-code is but also have some idea how to manipulate all those numbers.

This is an introduction to the internal workings of the two Oric machines. Graphics, sound, Rom, keyboard reading and more are dealt with, and several routines to be used with Basic (such as a *Trace* utility) are listed.

My fear is that possibly the book contains too much for the sake of clarity, and it lacks an index. However, for the Oric owner keen to use the machine to its full it is probably worth investigating.

John Minson



48K SINCLAIR ZX SPECTRUM

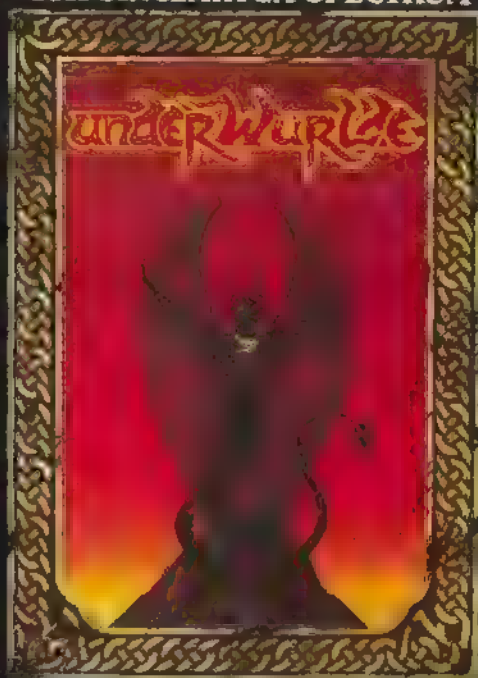


BBC MODEL B 1.2 OS

48K SINCLAIR ZX SPECTRUM



48K SINCLAIR ZX SPECTRUM



COMMODORE 64



"KNIGHTLORE", "UNDERWURLDE", "SABRE WOLF", and "STAFF OF KARNATH" recommended retail price £9.95 inc VAT. Available from W.H.SMITH, BOOTS, J.MENZIES, WOOLWORTHS and all good software retail outlets. Also available from ULTIMATE PLAY THE GAME, The Green, Ashby-de-la-Zouch, Leicestershire LE66 5JU (P&P are included) Tel: 0530 411485



# FEATURES

4 "SOUND" VOICES

+

MAX 256 COLOURS  
ON SCREEN AT ONE TIME

+

DIAGNOSTIC "SELF TEST"

+

CASSETTE "SOUND TRACK"  
CAPABILITIES

+

64K RAM

+

+

PROGRAMMABLE  
JOY STICK PORTS

+

+

SPRITES

+

+

CARTRIDGE SLOT

+

+

MONITOR SOCKET

+

+

+

BUILT-IN "BASIC"

+

+

+

+

COMMUNICATIONS  
CAPABILITIES

+

+

+

+

REAL KEYBOARD

+

+

+

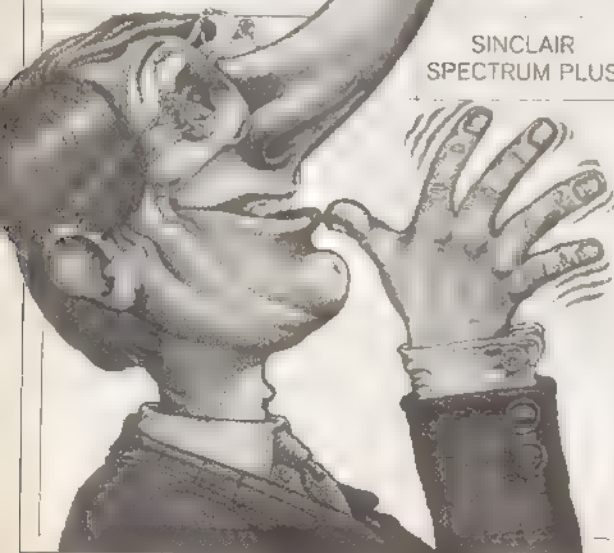
+

SINCLAIR  
SPECTRUM PLUS

ACORN  
ELECTRON

COMMODORE  
64

ATARI  
800 XL





# AT £169, LOOK HOW THE ATARI 800XL COCKS A SNOOK AT THE COMPETITION.

AT LAST, SERIOUS HOME COMPUTERS ARE UP AGAINST SERIOUS COMPETITION. THE ATARI 800XL OFFERS EVERYTHING COMPETITORS IN OUR PRICE RANGE OFFER. AND, AS YOU CAN SEE ON THE LEFT, A GREAT DEAL MORE. PLUS SOFTWARE PRICES THAT START AT LESS THAN £10.

## ATARI 800XL

FOR FURTHER DETAILS CONTACT YOUR NEAREST ATARI DEALER: ARGOS, BOOTS, CARREFOUR, CO-OP, CURRYS, DIXONS, GANADA, JASKYS, LEWINS, LITTLEWOODS, MARRIS, MUMFORDS, SITA SHOP, SPECTRUM, YALANCE'S, WATFALL'S, WOOLWORTHS AND ALL OTHER COMPUTER SHOPS.

## YOUR OWN SOFTWARE BUSINESS

MANUAL  
PLUS  
CASSETTE

### A COMPLETE PACKAGE

For less than the price of a games tape you could be on your way to earning money selling your own or other writers' programs. Our illustrated manual will show you how to set up your own full or part-time Software Business working from home. All practical and legal aspects are covered.

- ★ ADVERTISING
- ★ PRESENTATION
- ★ CONTRACTS
- ★ OUTLETS
- ★ RAISING CAPITAL
- ★ MARKETING
- ★ SIGNING WRITERS
- ★ TAX, N.I. ETC

Analysing your advertising results is an important part of profit making so the package includes a special multi-part program to enable you to see at a glance how your business is doing! (Spectrum Only — Listing included for easy conversion to other micros)

MAKE A NEW START TO THE NEW YEAR!

**ORDER NOW** Get your package by sending £4.99p TODAY to:-

T.M.B.  
**MARKETING**

15b KINGSWOOD RD, PRESTWICH, MANCHESTER M25 7AB



## TOUCH-TYPE

FOR THE 48K Sinclair Spectrum

### DO YOU YEARN TO DO SOMETHING USEFUL ON YOUR SPECTRUM?

Are you fed up with silly games? Make this the moment you take a step forward using your Spectrum into the world of "The Office of the Future!"

Learn to touch type on any QWERTY keyboard using the Spectrum as the teaching machine.

- ★ Full touch typing (no eyes down at the keyboard) from the first lesson.
- ★ Carefully designed lessons progress from key learning to speed practice at each stage.
- ★ Full ten finger touch typing with correct left and right shift key operation.
- ★ Learning psychology built in to the program to keep you motivated and interested in progressing.
- ★ Full feedback of performance — you know it is working — you are learning to type.
- ★ Learn at your own pace neither hurried nor restricted by other pupils.
- ★ Comprehensive instruction manual included with every cassette.

In this age of computers isn't it time YOU learned to type!

**£8.95 inc p+p and VAT.**

To JCS SOFTWARE, Puddocks Close, Cobham, Surrey KT11 3BU Tel 0832 68354. O.K. I'm ready to step forward and improve my ability. Please send me a copy of TOUCH-TYPE for the 48K Spectrum. I enclose a cheque for £8.95 (Please make cheques payable to JCS Software)

Name .....

Address .....

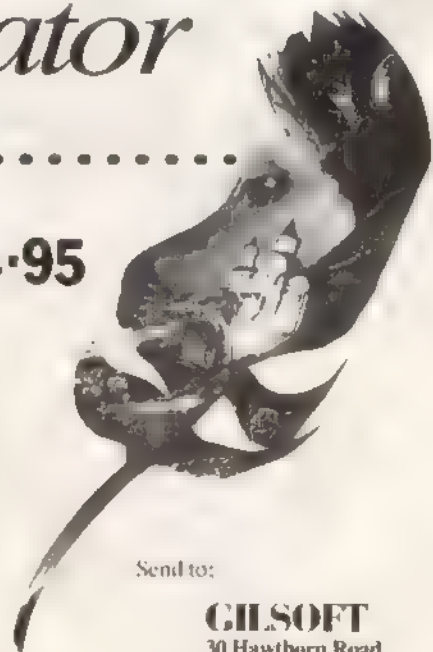
pcw11/22

**TOUCH-TYPE TOUCH-TYPE TOUCH-TYPE TOUCH-TYPE for the Spectrum 48K.**

# The Illustrator is imminent .....

Now you can add graphics to your Quill Written Adventure.  
For use in conjunction with The Quill Adventure Writing System on the 48K Spectrum.

**£14.95**



Send to:

**GILSOFT**  
30 Hawthorn Road  
Barry  
South Glamorgan  
CF6 8LE

Please rush me an order form and full details of The Illustrator for the 48K Spectrum.  
I enclose a stamped addressed envelope.

Name .....

Address .....

# Tony Bridge's Adventure Corner



## Far and distant lands

The airways of the world have been really busy this week with readers of The Corner in far and distant lands, eager for enlightenment.

First out of the bag was a letter from Malcolm Schmidt, of Kelvin in South Africa. He wrote to me some weeks ago about *Zork I*, but has since solved the adventure. Thanks very much, Malcolm, for the detailed map on *Zork I* and *Planetfall*. I'm sorry that you haven't had much luck with The Corner, but please let me know about your experiences with *Enchanter*, which I'm sure you'll enjoy.

In the same post, The Grand Elf received a letter from Peter Craven of Blairgowrie, in the Transvaal, also in South Africa. Peter is a newcomer to our hobby and has just finished *The Hobbit*, with a score of 67.5, as well as *Inca Curse* and *Snowball*. As *Planet of Death* — to get past the Forcefield (which, incidentally, is the problem that gives everybody a hard time), *Fire Laser* twice (very unfair, this one, as there is really no clue at all) and then *Dance*, bearing in mind what you are hearing on the transistor.

You'll need the boots to wade into the lake (*Wear Boots, Go Lake*). Here you'll find a coin, and you may need this if you're thrown into jail. The gloves you'll need to open the door to the computer room. *Urban Upstart*, give just the Lager to the football fan — you'll need the fiver to get into the airport. The Small Key will, indeed, start the plane, but to fly it, you'll first need to

learn how to! Try *Reading the Book*!

Peter also asks: "There must be other magazines worth buying that have adventure reviews and give help to lost travellers like me. Can you recommend any?" I certainly can, Peter: since The Grand Elf started the Adventure Corner some 18 months ago, most computer magazines have a page devoted to this rapidly-growing pastime. Most of them are pretty awful, but Keith Campbell's column in *Video and Computer Games Monthly* is one that I always read with great interest, as is the weekly page in *Personal Computer News*, written by the Gerrard Brothers and Bob Chappell among others.

I mention these in the cause of impartiality, as the one that I would recommend to you is our sister magazine, *Micro Adventure* which, as its name suggests, is devoted to adventures.

A bit closer to home is Noordwijkerhout, in The Netherlands. This is where Mr P Woodhouse lives, and he writes asking for some advice in a couple of well-loved adventures. "How do I pass the Troll without losing one of my treasures? And, in *Magic Mountain* (by Phipps Associates), how do I cross the Chasm?" To pass the Troll without paying, you must, first of all, acquire the Golden Eggs — then go to the SW side of the chasm. When you try to cross, the Troll will stop you, and you will then throw the Eggs to the Troll. To get back, you must have the Bear with you (make friends with him first!) and then throw him at the Troll. As for the Chasm in *Magic Mountain*, first of all, get the Stick, which can then be used to *Reach Rope*. With this, you can *Swing Across*.

Back now in Britain, Mr J Jenkins of Bicester writes: "My son is having trouble in an adventure called *Espionage Island*, by Artic Computing. His problem is getting past the first task, parachuting from the plane. From what I have observed in magazines such as yours, it would appear to be not so much the instruction but rather the way it is phrased."

Yes, Mr Jenkins, this can be the most frustrating part of adventuring. Personally, I think that the puzzle should be the difficult part of an adventure.

As to the problem: To get out of the Plane, first *Get Parachute*. Then *Wear Parachute*. *Pull Lever* (to open the door), *Pull Cord* and

finally *Unstrap* (or *Drop*) *Parachute*.

Now, the Beeb. Phil Rimmer has a Bee in his Beeb about this, and says: "Please don't forget that the BBC users also enjoy adventure — let's have a few more BBC adventures on your page." I know, Phil, that

## Snowball



## Level 9 Computing

Beeb-users are avid adventurers — they have some of the best available such as *Castle of Riddles*, which is one of the adventures giving Phil a problem. "How do I get out of the Black Maze?" Once in the Maze, *Wave the Black Rod* — this will give a puff of coloured smoke. If you move so that the smoke is coloured according to the colours of the rainbow.

Now to the adventure from Channel 8, *Escape from Pulsar 7*. Phil is stuck in the very opening: "I can't get out of the first three rooms — how many objects are hidden in these rooms?" This adventure starts off in a Social Room, in which is a couch. On the couch are a Note and Key, and moving the couch reveals a Rod.

Moving objects in many adventures, particularly Channel 8's, will often uncover useful items. Proceeding South into a Cabin. *Close the Door*, which uncovers a Pillow on a Bunk. Go to the Bunk and move the Pillow, thus finding another object — now return to the Social Room and *Go West* to the Bedroom. Go to the Bunk, *Examine Bunk* — find an air vent, which is your route to other parts of the adventure.

## Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair — help is at hand.

Fill in the coupon, explaining your problem,

send it to us, and a fellow adventurer may be able to help.

Remember — the system only works if those adventurers who have solved the puzzles get in touch. Every week is Save An Adventurer Today (SAAT) week!

Adventure Problem

on (micro)

Name Address

This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So, if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further write to: Tony Bridge, Adventure Corner, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.



# HERE'S WHAT YOU'VE SAID.....

"The standard of the programme is far, far better than we were expecting" ALAN DAIRE.

"Eureka! is superb. It's marvellous to have computer software of such high standard from Ian Livingstone"  
CAROLE SKAIFE.

"It's taken over my life - I only have three hours sleep a night. I hated adventure games before this but Eureka! is brilliant!" ANONYMOUS CALLER.

"Congratulations on producing such an entertaining and stimulating package" J. GOODENOUGH.

"I would like to thank all involved for making such an interesting game, especially the riddles"  
NORMAN SCOTTER.

"Please, give me a clue to the £25,000"  
CHARLES COOPER.  
(Sorry, Charles)

"I hate this game. I seem to be missing all my favourite TV shows" ADAM BOWLES. (Poor old Adam)

# Eureka!

## TELL US WHAT YOU THINK.



## Word processing

John Martin of Nicosia, Cyprus, writes:

**Q** I am a regular reader of PCW, which is always available here in Cyprus, but at twice the UK price, and always look forward to your column.

Could you please tell me which would be the best Wordprocessor program for my Spectrum 48K, as I want to use it with my printer for letter writing, etc. So far I've heard of only two Spectext and Tasword II, but I'm sure you'll know of many more.

**A** You don't mention if you have microdrives on your machine, if you don't have them and you are thinking of buying them at some point, then my advice would be to get the new Wafadrive from Robotronics, which enables the use of their excellent word processing program (probably the best I've seen on a Spectrum).

If that is too expensive, then Tasword II, which I have used, is an extremely useful program, and at the price represents good value for money. I have not used Spectext myself, but have not heard of any major problems with it.

## More ram

P Brown of Great Dunmow, Essex, writes

**Q** Is there any reason why it would be impossible to increase the Ram of a 48K Spectrum by adding one of the advertised 32K add-on ram packs?

**A** There is absolutely no reason why you cannot add an extra 32K to a 48K Spectrum. The problems start when you try and use the extra memory. The 280 is only capable of addressing 64K of memory; ie, the 16K in Rom and the 48K in Ram. Without the use of some form of memory switching technique, any memory in addition to this 64K maximum is completely wasted.

Also, any software that you wrote to utilise the extra memory (were you able to use it) would not be really marketable, and would also require special Loading and Saving techniques. I suspect that by now you are beginning to appreciate why there has not been a flood of people buying these Ram extensions!

## Program problem

Peter Hills of Bulls, New Zealand, writes:

**Q** I am a Spectrum 48K owner having a problem with just one program — Football Manager by Addictive Games.

All the other programs in my library give no trouble at all. But with Football Manager, right at the beginning before the first match highlights are played, it stops with a 'Nonsense in Basic Line 6560' error message.

I will mention at this point that the tape will load and play perfectly on my friend's Spectrum using my tape recorder or theirs.

Listing line 6560 shows that on my machine instead of having LET a(1) — etc, I get LET a(1,?????) — etc. The spurious full stop and five question marks are impossible to remove. They can be edited out, but will reappear when the program is Run again. Do you have any thoughts on what is causing the problem?

**A** This is, unfortunately, quite a common problem with the Spectrum. It seems that certain cassette tapes will always cause trouble on a particular machine, whilst loading perfectly well on another.

In your case the solution to your problem is quite straight-

forward. The facility exists in Football Manager to Save a new version of the game, so as to continue your meteoric rise to First Division fame and glory. All you need to do is to Run the program, obtain the famous error, correct it and carry on playing until you get the opportunity to Save the game.

At that point you should save your current position (which also saves a new version of F.M. for you), on to a blank cassette.

If you find that you cannot get the program to restart, after correcting the error, try Goto 6560. That should solve everything. If my advice doesn't work, please write to me again, enclosing a listing (if possible) of the affected part of the program, so that I can check it with my version.

## Screen load

N Blow of London writes:

**Q** I am writing a program with a loading screen, and I want to save the whole thing; ie, loading screen plus main program. Could you tell me how to do this, so that it loads the screen, then the program and then runs?

**A** There are many ways of achieving what you want, the easiest is the use of a 'Loader' program. An example is shown below. The main idea behind the loader program is to control the loading of other software into the computer for one program. For instance, a program which requires a loading screen, a main Basic program, and a set of machine code subroutines. On machines like the CBM this technique is called Bootstrapping. The loader program example I have given is for the Spectrum.

```
10 REM Loader Program
20 CLS: BORDER 4: REM clear screen and set border colour
30 LOAD "SCREENS" REM load screen
```

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem Peek It to Phil Rogers and every week he will Poke back as many answers as he can. The address is Peek & Poke, PCW, 12-13 Little Newport Street, London WC2R 3LD

40 LOAD "": REM load main BASIC program

The main Basic program is saved so as to auto run, by using the Save "fred" Line start-line, format of the Spectrum Save command.

## Array sum

J Holmes of Glasgow, writes:

**Q** Can you help me with a CBM 64 Basic problem? 10 DIM S(12):DIM TP(12) 20 FOR T = 1 to 12 30 ?CBM(147) 40 INPUT "Salary for month"\$(T) 50 INPUT "Tax paid this month"\$(T) 60 NEXT T

How do I find the sum of all the TP and S arrays? Do I have to do:

AS = S(1) + S(2) + S(3) + S(4) + S(5) + S(6) + S(7) + S(8) + S(9) + S(10) + S(11) + S(12) etc, or is there another way?

**A** This following gives you the sum of both arrays (in AS and AT), which you could then print at the end of your For loop.

```
15 AS = 0:AT = 0
45 AS = AS+S(T)
55 AT = AT+TP(T)
```

## Pools prog

P Edwards of Mid Glamorgan, writes:

**Q** Please would you let me know whether it is worth doing the pools from a computer, as I have a program and the most score draws it will find is between four and five a week. As I own a CBM 64 your comments would be most welcome.

**A** I used to do the pools regularly, and my weekly score draw average was between 0 and three, so your program easily beats me. Seriously, though, with something as random as score draw selection, a computer is not going to be a great help.





CALL DIANE DAVIS ON 01-437 4343 FOR SEMI/DISPLAY ADVERTISING

## GAMES SOFTWARE

### ONSPEC SOFTWARE FOR THE 48K SPECTRUM

#### ONE MAN ARMY MD 300

A multi-player or two player game. You can play singly, or with a friend. You can play on a single screen, or on two screens. You can play on a single screen, or on two screens.

Only one player can play at a time. You can play on a single screen, or on two screens. You can play on a single screen, or on two screens.

ONSPEC SOFTWARE  
1 Jubilee Close, Middle Rd.  
Thrupp, Stroud, Glos. GL5 2DP

**DODGE EMI** try to survive driving around the minefield. For the 48K Spectrum £3.00. From J. Kane, 9 Killyn Gardens, Kirkcubrecht G66 2PU, Scotland

## SUPERPOWER

An entirely new strategic War Game for the SPECTRUM 48K. Just £5.50 inc. Post.

HOWARD MARKETING (AD. 1)  
PO Box 21, FELIXSTOWE, SUFFOLK IP11 7LJ

## COMPUTERS & SOFTWARE

See also: 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 2681, 2682, 2683, 2684, 2685, 2686, 2687, 2688, 2689, 2690, 2691, 2692, 2693, 2694, 2695, 2696, 2697, 2698, 2699, 2700, 2701, 2702, 2703, 2704, 2705, 2706, 2707, 2708, 2709, 2710, 2711, 2712, 2713, 2714, 2715, 2716, 2717, 2718, 2719, 2720, 2721, 2722, 2723, 2724, 2725, 2726, 2727, 2728, 2729, 2730, 2731, 2732, 2733, 2734, 2735, 2736, 2737, 2738, 2739, 2740, 2741, 2742, 2743, 2744, 2745, 2746, 2747, 2748, 2749, 2750, 2751, 2752, 2753, 2754, 2755, 2756, 2757, 2758, 2759, 2760, 2761, 2762, 2763, 2764, 2765, 2766, 2767, 2768, 2769, 2770, 2771, 2772, 2773, 2774, 2775, 2776, 2777, 2778, 2779, 2780, 2781, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2789, 2790, 2791, 2792, 2793, 2794, 2795, 2796, 2797, 2798, 2799, 2800, 2801, 2802, 2803, 2804, 2805, 2806, 2807, 2808, 2809, 2810, 2811, 2812, 2813, 2814, 2815, 2816, 2817, 2818, 2819, 2820, 2821, 2822, 2823, 2824, 2825, 2826, 2827, 2828, 2829, 2830, 2831, 2832, 2833, 2834, 2835, 2836, 2837, 2838, 2839, 2840, 2841, 2842, 2843, 2844, 2845, 2846, 2847, 2848, 2849, 2850, 2851, 2852, 2853, 2854, 2855, 2856, 2857, 2858, 2859, 2860, 2861, 2862, 2863, 2864, 2865, 2866, 2867, 2868, 2869, 2870, 2871, 2872, 2873, 2874, 2875, 2876, 2877, 2878, 2879, 2880, 2881, 2882, 2883, 2884, 2885, 2886, 2887, 2888, 2889, 2890, 2891, 2892, 2893, 2894, 2895, 2896, 2897, 2898, 2899, 2900, 2901, 2902, 2903, 2904, 2905, 2906, 2907, 2908, 2909, 2910, 2911, 2912, 2913, 2914, 2915,







## FOR HIRE

TO HIRE: A computer from Spectrum 48K upwards, please phone or write to Business & Computer Services, 29-34 Caledonian Road, London N1 1BA. Tel: 01-607 0157

## WANTED

Contract programmers required for a wide variety of work. A full agency service is offered and top fees are paid. Please send details of experience and other relevant information to: S.O.S., P.O. Box No 138, London E1 9PW

WANTED: Top cash paid for home computers and accessories in good condition. Bring or mail (phone for quote). Computamart, 195 Seabourne Road, Southbourne, Bournemouth Tel: (0202) 433759.



is seeking authors for new titles to add to its highly original and successful book range. Experienced and first time authors are invited to submit manuscripts, ideas or fields of interest. Full details of what we can offer from David Lawrence, Book Editor, Sunshine, 12-13 Little Newport Street, London WC2R 3LD. Sunshine Publishers of Popular Computing and Dragon User.

## THIS SPACE FOR SALE

£18

TELEPHONE:  
PCW CLASSIFIED  
01-437 4343 Ext 206

## FOR SALE

CBM 64, C2N case, 1541 disk, approx £500 spare (case and disk), manuals, loads, books etc. All boxed, little used £500 will consider swap for BBC B) Tel: 0525 377094

BBC B 1.2 O/S with disk interface - 14" medium res microdrive colour monitor - computer desk, Alt - 11 games and 3 blank discs - several manuals £650 Tel: Guildford 64503

48K SPECTRUM plus £160 software plus joystick and interface £140 Tel: 01-952 8381

ACORN ELECTRON with data recorder, mains adaptor, all leads instructions and extra software. Still under guarantee as new £190 Tel: 01-359 9016 (Islington) evenings

ACORN ELECTRON - software £150 Atari joystick, Red Tracer (Spectrum), DKTronics light pen very cheap Tel: Dave G.X. (0753) 888474

VIC-20 - cassette 16k expansion, super expander machine code and games cartridges 20 - original games books, joystick, asking £150 uno. Phone (051) 424 1326

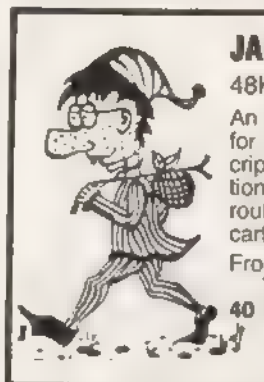
SHARP MZ 80K. Single disc drive, sharp dot matrix printer, excellent condition, many programs. Cost £1500, new. Offers, phone daytime 0625 551534, Mr Franks

COMMODORE 64 - C2n cassette unit + joystick mags, Adman speech synthesiser 34 original games inc. Valhalla Quo Vadis, Loco, Manic miner etc. worth over £600 will sell for £350 uno. Phone Godstone (0883) 843777 after 6pm

SELLING OR BUYING a used computer equipment in London and the home counties? The Computer can help you! Tel: 0375 642434 (anytime)

48K SPECTRUM books, mags, tape recorder, £200 Original s.w. Tel: Colwyn Bay 31783 After 4pm SPECTRUM S/W all original inc. Trans-Am Jet Pac, Hungry Horace, Pole and many more £2.00 each inc postage Tel: Talsfield 812

FOR SALE Spectrum s.w. inc. Sabre Wolf £8.00 Jetset Willy £4. Airliner £6. Gobbie a Ghost £4. Road Runner £4. Lunar Jetman £4. Blue Thunder £4. Tel: 041-881 6450 Ask for Campbell



## JACK IN MAGICLAND

48K ZX SPECTRUM £6.95

An educational adventure for 7-12 years. Features descriptive and atmospheric locations, large vocabulary, save routine, full notes and book of cartoon illustrations.

From:

TURTLE SOFTWARE  
40 School Road, Finstock,  
Oxford.  
Tel: (099386) 249

## Christmas Bargains

QL £375, Spectrum £120, Spectrum - £170, BBC B £380, Electron £190, Goldstar MSX £220, Sanyo MBC-550 £725, MBC-555 £940, CBM 64 £185, CBM 1541 Disk £210, CBM Data Recorder £40.00, Sinclair Expansion Pack £95, Microdrive/Interface £47, QL Monitor £260. Printers, Rileman £250, Olivetti JP101 £200, Cannon JP 1080A.

Cheque/P.O. to:

AHMEDI INTERNATIONAL  
Unit 1, 9 Winchester Street,  
London W3 8PA

Phone for additional offers: 01-992 1362  
Delivery 7-10 days subject to availability

## Computer Swap 01-437 4343

Free readers entries to buy or sell a computer.  
Ring 01-437 4343 and give us the details.

## Spectrum for Sale

SPECTRUM SOFTWARE for sale all originals New titles, Jasper, Astronut, 7 in 1, Nu Nog, Underworld - many others. Phone Christopher (0234) 60724

ORIGINAL SPECTRUM keyboard Used only for one week. Exc. Cond. £8. Tel: 061-620 2598

SPECTRUM SOFTWARE Trader, Trux 3D-Tanz Chattered flag Pinball Wizard, Zoom, Ghost Hunt, Football Manager, Full Throttle, Cricket Captain, Trigate Handicap Golf All £2.45 each. Andrew Storey 152 Otton Rd Carlisle, Cumbria

ZX SPECTRUM 48K - £100 worth of software + Kempston joystick all boxed. Worth £250 but selling for £150. For more details Tel Ramsey (0487) 840968 Evenings only

48K SPECTRUM interface 1, microdrive Kempston joystick + s.w. £180 Tel: 061-432 4631

SPECTRUM PRINTER for sale. Excellent condition only used four times. Four rolls of paper plus Taswork cassette. Phone: Fellingdon 6654 Her Spn. Ask for Steven. Only £30. Will negotiate

SPECTRUM SOFTWARE for sale in Clodion River Road. War of the Worlds, Klokton, Wil, Kosme Kangs, Horace Games, Sherlock, Paytron, Ugh Monkey Business, Audiomart all originals. Ring Philp (0809) 477189

48K SPECTRUM and Sinclair printer. Also £100 worth of software including 3D Ant Attack and Scrabble. Will sell for £200 inclusive one Tel Burgess Hill 2760 after 5pm

DKTRONICS Spectrum keyboard. Never used. Still boxed 3 months old. '35. Tel Chesterfield 810922 5pm-9pm. Ask for Anthony. Address: 17 Darborough Road, Clowrie, Nr Chesterfield, Derbyshire. S43 4RA. Must collect

48K SPECTRUM Alphacon 32 printer. An fully boxed Plus load of game. All original. £150 Tel: 01-785 9018

48K SPECTRUM tape recorder, Alphacon printer, over £100 of original software everything in excellent condition. cost over £330, sell for only £200. Tel: 01-449 1571, Ask for Jeremy

48K SPECTRUM interface 1, microdrive Alphacon printer & paper DKTronics programmable joystick interface (all boxed). Also Quicksheet 11, joystick books, magazines, software microdrive cartridges and blank cassettes. Only £325 Tel: 041 771 8638

SPECTRUM SOFTWARE for sale. 25 recent originals going from 50p to £4.50 T.L.L. Tank dual Cavern, Fighter, Stomkers, Pl Balled, Wheelie Krakatoa, hargang galore Ring 041 274 2982, after 6 pm

48K SPECTRUM with interface 1 - microdrive, joystick + programmable interface, CRL Fifth (extension to Basic) Transam and 3D Tunnel, total cost £280 - sell for £250 o.n.o. Phone (061) 881 5663, after 6 pm (ask for Almond)

SPECTRUM SOFTWARE all £2.00 each Arcadia, Ant Attack, Alix, Atak, Alchemist, etc. Hobbit £5 an new plus Spectrum Books. Phone for titles and prices. Tel: Liphook 722581 (Hants) after 8 pm (Sedell)

SPECTRUM SOFTWARE Blue (Hun-der £4, Zaxxon £2.50, Ground Attack £2.50, Battle of Britain £2.50, Slippery Sid £3.00, Nightlife £2.00 Tel: Farnham 897016 original only

## Commodores for Sale

VIC 20 - CASSETTE switchable Ram, joystick software books + mags £100 Tel: Minsterworth 403

VIC 20, £40, C2N £20 32K switchable Rampack £25, Quicksheet joystick £5 5 Commodore education packs £25 Plus s.w. £30. Or £135 for the 11 Tel: Ken 01-764 1919

CBM PRINTER MPS 801 £200. Boxed + guaranteed. Tel: Tunbridge Wells 32916

16K, VIC 20, C2N, 100 of games. Over 200 mags, books £100. Or swap for CBM 64 Tel: 01-987 6461 (day) Mrs Ruster 01-515 0716 (even)

VIC 20 - £800 of all accessories. Original games only 20K £145 uno Tel: 061-643 5858

CBM 64, C2N Recorder, 2 joysticks 11 original games inc. Hobbit, Manic Miner, International Soccer, Pipe Line, Dunt Cover, Maps, £300 uno Tel: 0274 87658 after 5pm

VIC 20 - C2N + 16K Ram, joystick adventure cartridge. Intro to Basic part 1. Programmer Reference Guide. Dual Cover £100 Tel: West Orayton 441004

VIC 20, CASSETTE and 16K Ram £50 of original s.w. Kempston pro-joystick Learning Basic Part 1 Tel: Stevenage (0438) 61913 £130

CBM 64 SOFTWARE. Kooqaboo, Aquanaut, Sheep in Space, Killer Walt, Space Pilot, Cypriotian Forbidden Forest, Blagger, Maziacs, Hobbit, China Miner, House of Usher £3.60 each. Originals. Tel: 0630 57129 10pm-10pm. CBM 64 S/W Hobbit, Revenge MC, Odyssey, Armageddon, Music Composer, International Soccer - £30's worth of mags. In all worth almost £85. Will sell for £40 Tel: (0272) 660164

VIC 20, CARTRIDGES Gord, Chess, Radar Rat Race, cassettes Krazy Kong, Arcadia Wacky Waiters, Gndrunner, Centipede, Skramble, all for £52.00 including post and packing Mr. McGhee. 139 Southfield Road, Blackwood, Lanarkshire

CBM 64, 1541 disk drive, cassette unit, Quicksheet 11 joystick, £300 worth software, books, magazines, 20 disks, disk box. Worth £750. Offers around £400 Tel: Richard on 0504 43305 after 6pm. Will deliver

VIC 20, C2N, 16K switchable Ram five cartridges, £180 software inc. Jetpac, Trader, Manix, IPR + 1, books, mags, games (on tape) - colour TV game, five

cartridges boxed G.C. adaptor all £240.00 0292 45477

**VIC 20 + STARTER pack + C2N + 32K Ram + joystick + Centronics interface + £160 original software + £20 of books + mags.** All worth over £400. Will accept £180. Phone 01-807 1724

**CBM 64 + C2N + joystick + games over 40 originals (games).** Buyer must collect. see condition all for £250. Ring Mark on 675110 Bristol.

**CBM 64 GAMES FOR SALE** Manic Miner, Dally's Decathlon, Solo Flight, Quak Atak, Crazy Kong, Hover Bover, Arabian Nights, and Chiller Various prices or £30 the lot. Phone Cheslyn Hay 418340

**VIC-20, CASSETTE UNIT.** 16k Ram-pack, super expander, Mikro assembler, adventure cartridge, 4 bit mother-board, plus various tapes and Vic Revealed VGC £120 one. Tel: Nottingham (0502) 204058 after 8pm.

**ZAXXAN FOR CBM64** sell for £9.00 or swap for Black Forest Chateau. Tel: Saddleworth 2518 (Cliffham) Also Avialor for BBC for sale £8.00 - £45 2518

**COMMODORE 64K + cover.** C2N cassette recorder, TV, joystick, etc 14 games, still guaranteed, cost £400 new, will sell for £250 one. Tel: Littlehampton 7222307 evening

**VIC 20 CARTRIDGES:** prog. Aud. CBM8K, C15 each. Info to Basic Part (two 18 Rog Peritts BA Lodge Land, Aston, Sheffield S31 0RP Tel: 0742 872343)

**COMMODORE 64** software. Utopia synth cost £15, sell for £10 (still new). **COMMODORE 64**, disk drive, C2N, joystick, computer desk and collection of original american software including Zork, Planetfall, Pole position, FSII etc. All for £400. Please call Nanger 78676 after 8pm

**VIC 20 + cassette unit** infor to basic PT1, software, books, £70 one. Tel: Dartford (pew) 28800

**COMMODORE 64** programs for sale or exchange. Zim Sato BM £3.00 Kokotoni Will £2.50 Channel W's Circus £2.50 Many more cheap. All originals. Phone Rotherham 70140

**CBM 64 C2N cassette** w joystick, reference guide, lots of s/w £210 one. Tel: Hasteicos (07910) 3102

**CBM 64 SOFTWARE** Sherlock, Quill £12 each. Zodiac, Pyramid, Monty Mole, Pitfall, Killer Wall £5 each. Snowball (no instructions), Hunchback £4 each. All originals. Phone David on 01-267 6035 evenings only.

**VIC 20** Cassette player and 30 games, £75 18k ram pack, £20 3K ram pack, £5 Chess and Mission Impossible cartridges, £5 each. Tel: (0232) 619650 evenings.

**VIC 20 + 16K switchable rampack.** 70 games, joystick, cassette recorder, instructions to Basic Part I, dual cover, mags, books, £125 (0202) 511779

**16K VIC 20** s/w books, selling for £15. Under guarantee - Ring (0753) 32782 (Slough) evens

**COMMODORE 64 + C2N cassette + joystick + paddles + books + software + cover.** All worth over £300 All for £250 one. vgc still under guarantee. Tel: Holey (02934) 3922

**INTRODUCTION to Basic part I** £7. Home office word processor £5. Programmers reference guide £5. CBM joystick £3. Games and adventures for sale, all originals. Tel: Reading 23653

**HONEYFOLD** machine language cassette + book £5. Original games + adventures for sale Vic 20 revealed £3. Commodore joystick £3. Super Expander £20. Tel: Reading 23653.

**CBM 64 C2N cassette unit, joystick, software (including Mikro assembler, Utopia synth and Jeff Minter games) and**

books. Worth over £460, sell £300. Tel: Pontefract (0377) 703796

**CBM 64**, recorder, Quickshot joystick, C60 software including Flip Flop, Loco, Forbidden Forest, Hulk, all as new. Worth over £314, price £190. Tel: Thetford, Norfolk (0842) 62752 after 5.30 pm

**CBM PET 2001 8k**, w/integral cassette, offers. 324 memory upgrade for pet range, will fit above £40.00 o.n.o. Tel: Tadley 3375.

**S/W FOR VIC20** machine code monitor £15.00 o.n.o. Trash man cartridge £5. Tel: 021 784 2038

**COMMODORE 64** 1541 disk drive. MPS 801, printer, C2N, cassette, 30 mins basic plus £600 worth of s/w on cassette and disk £700 o.n.o. or swap for BBC + disk drive. Tel: 042 672058 Simon

**CBM 64** Books for sale: The Working CBM 64 £4.50 CBM Machine Code Master £5.50 CBM Program Book £4.00. All brand new. Kalkus £4.50. £3 Tel Northwick 78475 after 4 pm.

**VIC 20** 16k switchable ram, five cartridges, joystick, I.B.P.+1, £160 of s/w books, mags, s/w includes Trader Jet-pack, Skyhawk, + colour TV game two joysticks, five cartridges, adaptor all boxed £200 Tel: 0292 45477

**VIC 20** Switchable ram pack and 8 cassettes. inc Bongo Jet pack, Computer War, Tower of Evil, Flight path, Skyhawk, Psycho Shopper and Zorgons Kingdom. Worth £300, sell for £55 o.n.o. Tel: 061 477 2716

**VIC 20** Switchable ram-pack, C2N cassette recorder, Spectravideo, joystick, around £200 worth of software including Snowpat, Hell-gate arcade, £300 o.n.o. Tel: (061) 485 7852 after 5 pm on weekdays, 11 day Sunday

**16K VIC20**, cassette unit, printer, utility and games cartridges, speed synthesizer, 3-sink motherboard books and cassettes only £230 - will separate Tel: 01 310 4031 after 6 pm.

**CBM 64** cassette + 1 cartridge (Lazapian) all boxed, only 6 months old, £160 Tel: 0823 7523 (Notts area)

**LARGE AMOUNT** of Vic 20 and CBM 64 software (all original) for sale. Please send SAE to John Keogh, 30 Highwood Avenue, London N12 8CP.

**32K VIC 20 + datasette** inc 16k switchable ram and super expander, speech synthesizer, software books, assembler, joystick, intro basic 1 + 2, 14" sw by Ali for £150 o.n.o. Tel: Wickham 488 1470

**VIC 20** with cassette deck, 16k stack store board with Vic kit 2 s/w inc. 16 cartridges & mags. Any others, will separate. Tel: 051 722 3735

**PRINTER** for CBM 64, Vic 20. Pet Commodore model 4022, in-rs printer, new £399, sell £150, or swap for good Sony/Technics Stereo (etc) Phone: 08833 6687 (Surrey)

**CBM 64** software, original and half price. Including Flip & Flop, Suicide Express, Aztec, Trolle Wallie, Snooker, Kong, Caesar, Jammin Haxport, Quasar, Space Pilot. Phone: (03745) 58835

**VIC 20** 32K tape recorder, joystick, Computer 12 months old, wide selection to cassette and cartridge games. Contact Paul Ali for £100 Tel: 01-462 6249

### Acorns for sale

**BBC MODEL B** with official Acorn/DFS Speech System and Prism Modem. Worth over £600, bargain at £470, with £300 worth of software. Tel: Kidderminster 4828 after 5pm

**BBC "B" COMPUTER** with Cumana Onk Drive and 32K Solidisk sideways Ram. Plus software 5 months old. Little used £575 Basingsloke 51623

**ACORN - BBC MODEL B**, Basic 2 or 1.2 Acorn DFS, 100K Disk Drive, 32K Sideway Ram 40 disk + s/w extras. £500. Tel: (0427) 872026 evens.

**ACORN ELECTRON** 5 months old. Any offers. Tel: 01-459 3278

**BBC B**, 1.2 OS vgc boxed manual, load, s/w £250, Tel: Paul 01-369 8449.

**ACORN ELECTRON - BBC** data recorder, s/w, Quick Shot II, joystick, all leads, mags + all boxed £240. Tel: Percival 01-902 5036

**DISK DRIVE** BBC Mitsubishi 400K 40/80 Track, Switchable, single disk drive with over £1,000 worth of s/w on disk - tape all for £300 (05827) 69152

**DISK DRIVE** BBC Cumans 800K dual drive with 48K switch and PSU, supplied with over £1,000 worth of s/w on disk, tape. All for £450 (05827) 69152

**BBC B** 1.2 OS official monocheone monitor and cassette player. All 9 months old. Very good condition. Still in boxes. Must sell fast. £400 one. Phone 01-444 8349 between 4 & 5pm

**BBC/TORCH** computer system 3 1/2 months old, NAC printer, monitor, Database Accountant, Word processor + Cash Book programs + disks + paper £1200 Tel: Weston Supremare 813060

### Ataris for sale

**ATARI 400 16K**, 410 recorder, boxed as new. Offers invited. Tel: W.G. Davis 0432 267997

**ATARI 400, 16K** software recorder 2 joysticks, books + manual s/w (cartridges, tapes) worth £200. Sell £130. Tel: 01-204 2539

**ATARI 600 16K** Boxed Ideal for beginners £65. Tel: 0621 891715

**ATARI DISK ROM** - tapes to sell all originals, software - disks for £5. Roms £10, Tel: 0786 73599 Mr Crawford.

**ATARI 600XL + cartridges + joystick + Programs** Book. An excellent condition. Boxed £180 one. Swap 800XL Tel: J. Gadehouse (0522) 47445

**ATARI 400 16k** with recorder, joystick, books inside. Alan Basic, Games and recreations plus cassettes. £70 Tel: 01 906 5742 daytime.

**ATARI 400** - Basic quick shot joystick 4 10 program recorder + lots of good quality s/w. Bargain at £170 Tel: Cabbotown (Cathness) 689.

**ATARI VCS** with joysticks paddles, loads etc 5 cartridges inc Berserk, Asteroids good condition £50 o.n.o. Tel: 01-960 0094 evens.

**ATARI 600** 410 program recorder joystick 4 cartridges, several tapes, manuals, excellent condition, not very old £150 Tel: 021 783 2500

**ATARI 1020** colour plotter for sale at only £85 o.n.o. works with all Atari micros 20 40 80 columns text or graphics. Same paper and pens as Tandy One plotter. Phone: 0903 42013

### ZX81s for sale

**ZX81 S/W** eg. Flight Simulator, Hoppers and others at £2.50, all originals. Tel: 051 334 9696 after 5 pm

**ZX81 16K** good condition - software including 3D Monster Mazes, Mazegs, Black Crystal, Asteroids, Etc. + old mags and one books. Bargain at £40. Tel: Seb on 4958 (Ware)

**16K ZX81** for sale. The only ZX81 known which has 16k ram on-board, no ram pack needed! £300 n.o. Also spectrum manuals £2.50. Write to: Scott, 280 Hadden Place, Hawick Roxburgh, Scotland TD9 7BY.

**SINCLAIR ZX81** 16k add on, keyboard add on plus games cassette £300 n.o. Tel: 01-223 4708, Mr Berry

**ZX81 S/W** top games, all originals, less than 1/2 price. Ring 01-337 9194. Private sale only.

### Dragons for sale

**DRAGON 32**, six programs inc. Fruit Machine and Breakout, £3.50. Four utilities inc. Reset Disable and Auto-run, £2.75. Both for £5.50. Cheques to M. Brinell, 21 The Mead, Wallington, Surrey SM6 9OU

**DRAGON 32 BOXED** leads and manual. Fully working. Cassette recorder joystick. Cartridge 10 cassettes incl. The King. Users handbook. Worth over £200 sell for £100 one (0622) 45258 evenings only

**DRAGON 32 - S/W**, books, 3 cartridges Quickshot £80 Tel: 01-998 2561

**DRAGON 32 SOFTWARE** - Cruising, Tailing, Android Attack, Cave Fighter (Scramble), cost over £20 - sell for £10 also, the Working Dragon 32 Book, C3 and the Dragon Manual - £3 (0202) 57787

**DRAGON S/W**, TELEWRITER £28. Toolkit £140. Creepy Villa, Ring of Darkness, many more + books. Tel: 0951 74133 (all originals)

**DRAGON JOYSTICK**, Dust cover, Ocean Assembler/Disassembler + books. All as new £140 m.o. Tel: Brian 01 888 8101, Woodgreen

**DRAGON 32** plus 2 joysticks, plus tape recorder, plus software £100 o.n.o. Tel: 0481 33849 (Oxfordshire)

**DRAGON SOFTWARE** 17 original tapes includes The King, Space Shuttle, Culbourn Jungle, Culbourn Walkabout, 1 Cartridge (berserk) + 3 books. Total value £171 sell for £75. David McInch, 111 Graham Avenue, East Kilbride, Glasgow Tel: Fast Kilbride (03552) 70001

**DRAGON 64** with disk drive + joystick cassette, s/w books, mags vgc £400. Tel: Farnborough (0252) 511842 (vyn)

### Tandys for Sale

**TANDY TRS** colour 16K extended model 4 original s/w leads, manual + 1 joystick. Sell £110 one. Tel: Farnbridge (0732) 35 3642 evens.

**TANDY CGP-15** colour, graphics printer - Dragon lead, Cost £167 Sell for £90. Tel: 01-360 3443

**AQUARIUS + CASSETTE** player + all leads, manuals for sale £80.00 one or swap for 16K Spectrum. Tel: Saddleworth 2518

**APPLE II** 48k with Manual Single Disk Drive - silent VRE Apple Printers 1 IV + video output hardly used, £679 one. Tel: Worthing 230118 after 6pm

**ITT APPLE 48K** computer Base in Rom Colour Disk Drive + Panela Printer card Roms, Apple s/w with Apple Writer L/C etc £320. Tel: Exchange Dragon 64, Tel: Part 01-675 2959 (day)

### Wanted

**ACORN ELECTRON** owners! I will pay you up to £5 for your original software. No BBC software. Tel: Cardiff (0222) 843587 for details. After 6pm Ask for Jason

**SPECTRUM 48K** and loads of software, books, mags, programmable joystick. Swap for disc drive and the DFS for the BBC micro. Might sell phone 04668 6589 after 4.30pm

**EXPRESS SAILING** dinghy with trailer sails + safety equipment. Valued at £800. Swap for £400 of used computer equipment. Tel: 01 550 3564 anytime

**SWAP VIC 20** starter pack plus games - books or unique 40 channel CB with extras for Spectrum 48K with extras. East Horsley (Surrey) 4205

**MICRONET PRESTEL** for BBC 1.2. Acoustic coupler + s/w and all leads £45. 01-884 8574







**ALPHA COM 32** printer, for Spectrum or ZX81. 6 months old. Very good condition £45. Tel. South Hokenham (0708) 857010.

**TEXAS 1099/4A** s/w. Extended basic (new) £50. Various models from £5 to £14 inc. Blasto. Car wars, Chess, Munchman, Pacscie. Tel: 01-992 4548.

**BURROUGHS 880** mini-computer 2+8 drives, 2x2.3 megabyte drives + 30 2 3MB cartridges. Fully operational includes payroll, ledgers, account preparation, labelling, Cobol Compiler, Disk cleaner, Suit business or enthusiast £700 ono. Tel. Mark Rice (0604) 26045.

**PLOTTER-PRINTER** for TRS-80 and printer interface cable. Paper width 9", 75 characters across £99 ono. Tel: Waybridge 57442.

**BROTHER NR-15** professional electronic daisywheel typewriter + printer, centronics interface, comes complete with keyboard, 3 daisywheels, and error correction ribbons, worth £600. Accept only £300 ono. Tel. Andrew on 0625 614157.

**SINCLAIR ZX** microdrive and interface one, three cartridges and utility cassette. Complete with manual etc. Only £80. Tel: Norwich (0603) 406120 ask for Terry.

**VIDEO GENIE** EG3003 - books + 111 line programmable interface. £255 basic, suitable for control. Tel: 0535 44587 (Kighley).

**ORIC 48K** for sale, excellent condition. Over £100 worth of original s/w. Would make excellent Xmas present. Tel: 01-540 7860 for details.

**16K COLOUR** Genie with manual + tape recorder £65 ono. Tel: Rhyd 0745 55423 after 8 pm.

**ORIC 1**, Black + White TV cassette recorder. £45 of s/w. £55 of books, 10 editions of Oric owner mags. Open to offers. Tel: 01-699 5364.

**NEC 8001** business computer 24K microsoft basic 32K RAM RGB hi-res monitor 60x25, 7 colour display. CP/M compatible w/printer cost £850. Bargain £300 or Dragon 64 + cash. Tel: 01-673 7877 evenings only.

**PRINTER FOR SALE** Centronics 779, parallel interface, 3mm, cable offers David - Hornchurch 42642.

**ORIC MICRODRIVE 82A** Printer Dot Matrix 120 CPS. Block graphics. Parallel + serial interface. Complete with leads £150 ono. Tel: 0789 68080.

**EPSON TX80**, 120 CPS. Dot matrix Printer + 3 new Ribbons. Simple good quality printer. connects to most micros £150 ono. Tel: Ashbourne 70545.

**2 MICRODRIVES**, ZX interface + complete compatible cassette £200 of original s/w. Death Pack, Hobbit, Scorpio One, Kang £200. Ono. Tel: 01-992 1382.

**STAR GEMINI 10X** printer for sale. Uses all Epson codes, friction + tractor + single sheet PWO. £165 Tel: Leeds 766296.

**OLIVETTI DISK DRIVE**, suit BBC, Tandy, Video Genie etc. Good working order £75 ono. Tel: 08324 331.

**DOT MATRIX** printer Cosmos 80 142 columns £165. Telephone Hornchurch 55733 or work 01-584 3495 David Cole.

**ATMOS 48K** WITH software and books. Mini condition, still under guarantee. Great value at £85 ono. Tel: 0763-72829.

**UNWANTED GIFT** Telemet 2 modem compatible with BBC + C-64 no interface bought for £90 sold for £70 and Tel: Yarmouth (0483) 602977 Between 5pm and 8pm.

**48K LYNX**, original condition, with leads, into tape, manual and user mags £85 ono. Phone Hayes (Middx) 01-561 4652.

**FOR SALE TRS-80 Model 1**, 48K double density two disk drives printer + paper software manuals + leads £600 ono. Tel: (0905) 3563800 evenings Worcester.

**"THE TIME MACHINE"** by Channel Eight cost: £5.50. Tel: Blythe 47415 4pm-9pm, or write to 96 Woodlands Avenue, West Blythe, Weybridge, Surrey KT14 6AP.

**SHARP MZ 700** - TV monitor + data recorder + Space Invaders + Pac Man + Scramble and mailing list and more. Only 81 months old. Sell for just £200. Tel: 061-486 9601.

**CUMANA 100K** Disc Drive for BBC, four months old, hardly used. With cables, utility disc and manual. Excellent condition only £80. Tel: Chertsey (09328) 62124.

**SINCLAIR QL** (lates version), with printer and monitor cables £380. Tel: Adeen Faraham 662533.

**ORIC ATMOS 48K** excellent condition + £70 worth s/w books. four Oric owner mags, two cassette leads, £150 ono. Write or call at 62 Almond Avenue, Kedington, Oxford, OX5 1EW. Phone (0667) 54654.

**PHILIPS G7000** Video game with seven games worth £2000. Will swap for Spectrum 48K games or equipment of will sell for £60. Tel: 061-484 449.

**S/W FOR 48K LYNX** Inc. level 9, Colossal Adventure, snowball, Golt, Muncher, Numerus, Wilkow. Sold games Volume 1. £25 the lot. All original. Tel: (0728) 747348.

**TU994A** vgc with cassette leads, joystick interface, books - tapes £70 ono. Tel: 0580 78988.

**SHARP PC 145**, manual, boxed, yes, guaranteed for a ZX81 or sell. Tel: 01-804 3229.

**MUST SELL SHARP MZ700** computer with built-in 4-colour printer plotter and cassette plus Pascal M-code 4-basics zen ED/ASS and other software. Any offers considered. Tel: (0742) 471180 after 6.30pm.

**MODEL RAILWAY** layout M gauge 180ft track, 3 controllers, 6 locos, coaches, rolling stock, 30 unused value approx £370. Swap for computer or Commodore monitor. Phone (0395) 273143.

**PHOTO-COPIER** for sale, 3in Spolich Copier. Perfect working order. Accept £35 or swap for ZX81 etc (0224) 675717.

**TELETYPE ADAPTOR** for BBC £160ono. Tel: 01-968 3082.

**INTELEVISION** TV game with voice cartridge + 8 games £50 Spectrum 48K with 8 tapes (games) £35 Alan VCS s/w - missile command etc £75 Tel: 01-519 3674.

**CURRAN MICRO SPEECH** for ZX Spectrum. Excellent condition. Bargain at £18. Also "Shetlock" as new with manual for £7, and "Psytron" for £3. Tel: (0909) 477189 after 8 pm.

**SANYO M8C 555** monochrome monitor. Only £900 inc. of val + s/w eg. word star, data star, etc. Tel: Wigan (0942) 47423 before 5 pm. Gary or Dave.

**AQUARIUS** + data recorder £50. Tel: 061 308 4959.

**14 MICRODRIVE** Cassettes. £3.00 each. Tel: 01 458 6481 (eve.) Peter.

**FULLER FPS** Spectrum keyboard. £35.00 inc postage. Tel: Welwyn Gardens 24244.

**NEW BROWN MODEL A** £90 ono, also 24mth mono monitor (cost £110) £80 ono, will sell separately or together £150. Tel: 01 858 1782 (London SE3).

**MEMOTECH MTX512** 64 rarely used, new last Christmas, £315, inc 4 games, manual etc. Accept £175. Tel: Ruislip 77682.

**SHARP MZ 80 A** £175. Tel: Sheffield 872819.

**ZX PRINTER C/W** 4 rolls paper & p.s.u. still boxed. ZX81 Spectrum basic course book £4.00, ZX81 NEC £2.00. Tel: 01-663 8102.

**LYNX 48K** for sale as new with manual, leads and some software £140. Tel: 01-699 9185 SE London.

**APPLE II 54K Rampack** 280 CP/M pack pal, encoder + disk drive £550. 56 Park House, Seven Sisters Road, London N4.

**FOR SALE** Fuller FDS keyboard for Spectrum £30, Currah micro speech £20. Phone 358 3788 after 4 pm.

**VIDEO GENIE** EG3003 with built-in cassette comes with manuals, books (incl Capt 80 Adventure), and programs £90 + car Phone Phil (0642) 618475 after 6 pm.

**PERSONAL RECORDS** module for T199.41A computer. Tel: Downland 53157 (Croydon) eve.

**CUMANA DISK DRIVE** 40 track, nail height, sell £110 ono or swap for Pioneer car radio cassette player (auto reverse and digital tuning). Tel: 08833 6687 (Surrey).

**RGB COLOUR 14"** Microvitec monitor, Apple compatible, with case to match resolution 653(H) x585(V), excellent condition (still in original packaging) only £200 ono. Tel: (0203) 303784.

**SHARP MZ700** cassette printer/plotter, pen sits, rolls paper, software, games, utilities, books £275 ono. William Nagle, 19 Mondo Road, Glasgow G53 5UG. Tel: 041 883 0521.

**AMSTRAD CPC 444** colour computer including educational and game software only low months old, items in original packing, only £187. Excellent condition. Phone Cy on 0279 28689 between 6-9 pm only.

**SANYO DR101** cassette recorder good working order. sells for £20 or swap for BBC software. Tel: 01-304 3669.

## ADVENTURE HELPLINE

**Nonserate on Vic20**. I have a decomposing corpse, an old witch, a man-eating shark and a dark tunnel - help! **Tom Liverage**, 43 Callus Square, Ferrier Estate, Kidbrooke, London SE3 9NZ (Tel: 01-319 2190).

**Twins Kingdom Valley on BBC**. Can anyone help in the later stages of this adventure? **Richard Ankers**, 56 Ettington Close, Wellesbourne, Warwickshire CV35 9NJ.

**The Bulk on Spectrum**. How do I get the big gem? And how do I block the gas outlet? **Stephen Fitzgerald**, 10 Highfield Drive, Ickenham, Middx.

**Mountains of Set on Spectrum**. How do I get past the skull and the dragon? **Musgrove**, 53 Lower Village Road, Sunninghill, Ascot. Berks SL6 7AF.

**Deads Through the Drinking Glass on Spectrum**. How do you get out of Number 10? **Stephen Barnett**, 45 Linton Walk, Brookvale Village, Erdington, Birmingham B23 7YJ.

**Pub Quest on Commodore 64**. I cannot cross the road that is in front of the pub? How do you open the cupboard in the toilet? **David Bates**, 7 Danelaw great Lurley, Chester-le-Street, Co Durham, DH3 4LU.

**Woodoo Castle on Vic20**. I cannot get through the crack in the wall. **Conal Wright**, 120 King George's Avenue, Leiscon, Suffolk, IP16 4JJ.

**Snowball on Spectrum**. I need help! **John Rundle**, 26 Western Road, Aldershot, Hants GU11 3PL.

**Valhalla on Spectrum**. I don't understand the third clue that helps you find Skornir. **D Leech**, 12 Hillcrest, Halton Brook, Runcorn, Cheshire.

**The Count on Vic20**. How do I get to the tomb and what is the lens set in the oven. **Michael Turpin**, 118 Meadoway, Hodderdon, Herts.

**Hobbit on Spectrum**. After collecting the ring, where should I go? How do you escape the goblin's dungeon? **David McCall**, 20 Manse Crescent, Stanley, Perth, Scotland.

**Calibre Island/Shenanigans on Dragon**. How do I get to Calibre Island? **Shenanigans** - how do I get into the su-way? **Paul Mitchell**, 14 Honeybrook, Waltham Abbey, Essex EN9 3DD.

**Velour's Lair on Spectrum**. Velour always kills me with a bolt of lightning (I am a warrior). **P Sellick**, 1 Evenglade Park, Abingdon, Oxon OX14 3SZ.

**Four Gates to Freedom on Vic20**. What is the code to open the large metal door with the code-input panel? **Raymond Kirk**, Flat 1, 108 The High Street, Norton, Stockton-on-Tees, Cleveland.

**Valhalla on Spectrum**. All I can do is map adventure land. How do you start the quest? **Penny Webber**, 23 Osprey Park, Thornbury, Bristol, Avon.

**Hobbit on Spectrum**. How do you get out of the goblin's dungeon? How do you read the map? **R Smith**, 17 Kurton Close, Mansfield, Notts.

**Hobbit on Spectrum**. What do you do after opening the window to the goblin's dungeon? **A Saunders**, 141 Lenti Rise Road, Burnham, Bucks SL1 7BN.

**Valhalla on Spectrum**. I can't find Drapir. Who is my weak friend? **K Norton**, 8 Devonshire Close, Stavely, Chesterfield.

**Ship of Doom on Spectrum**. How do you get the key out from the glass cover? How do you get the body out of the ice block? **Mr Hughes**, 131 Holme Lacy Road, Purton, Hereford, HR2 8DG.

**Snowball on BBC**. I cannot find the combination to the door in the pink and green security alcove. Also, how do you use the screen? **Mark Neale**, West Kell House, Station Road, Patrington HU12 0NE.

**Dark Dungeons on Vic20**. What does the magic scroll say when it is decoded? **Anthony Coitman**, 42 Carlton Avenue, Kenton, Middx.

**Golden Baton on Spectrum**. I can't get into the caves under the hut (I can't find a light). I have got the rag and matches. **Stephen Manchester**, 32 Watt Street, Southcoates Lane, Hull, N. Humberside HU9 3BJ.

**Knight's Quest on Spectrum**. I cannot find the poppy to open the door. **Craig Waddell**, 14 Jarvie Place, Glenrothes, Fife, Scotland.

**Dragon 32**

1 (1)	Hunchback	Ocean
2 (5)	Hungry Horace	Melbourne House
3 (4)	Mystery of the Java Star	Shanda
4 (2)	Crackin' Eggs	Software
5 (8)	Outblown in Space	ADP
6 (4)	Mr Day	Microdeal
7 (6)	Kriegspiel	Beyond
8 (7)	Dragon Chess	Cass Software
9 (3)	The King	Microdeal
10 (10)	Bug Driver	Mastertronic

**Atari**

1 (1)	Attack of the Mutant Camels	Amnsoft
2 (3)	Computer War	Atari
3 (4)	Jason	Centros
4 (4)	Sub Commander	Creative Sparks
5 (9)	Tank Commander	Creative Sparks
6 (5)	General Massacre	Atari
7 (2)	Legion	Image
8 (7)	Champion	Amnsoft
9 (1)	Encounter	Hi Tec
10 (10)	Shaky	Centros

**Spectrum**

1 (1)	Daily Thompson's Onslaught	(Ocean)
2 (3)	Buschard	(OS Gold)
3 (4)	Kokoro WFF	(Ease)
4 (10)	Underworld	(Ultimate)
5 (8)	Avalon	(Hewson)
6 (9)	Daqer Maxie in Trouble	(Creative Sparks)
7 (2)	Knightmare	(Microgen)
8 (7)	Tornado Low Level	(Vertics)
9 (6)	Don't Be Mad	(Autosave)
10 (1)	Turned	(Bug Byte)

(Figures supplied by W H Smith)

**Visi 28**

1 (1)	Wizard and the Princess	Melbourne House
2 (4)	Duck Shoot	Mastertronic
3 (3)	Computer War	Creative Sparks
4 (8)	Max	Atari
5 (1)	Sub Commander	Creative Sparks
6 (2)	Tower of Evil	Creative Sparks
7 (10)	Sub Hunt	Mastertronic
8 (5)	Snooker	Vertics
9 (1)	Space Scramble	Mastertronic
10 (1)	The Perils of Willy	Software Projects

**Commodore 64**

1 (1)	Double Pilot	Digital Integration
2 (1)	PC Quiz	Atari
3 (1)	Hungry Horace	Melbourne House
4 (10)	Clunk	Lectra Games
5 (9)	Chiller	Mastertronic
6 (2)	Reacher	Centros
7 (1)	Serabee	Lectra Games
8 (1)	International Soccer	Commodore
9 (1)	Space Leo	Centros
10 (1)	River Raid	Activision

**Amstrad**

1 (3)	Harrier Attack	Dartell
2 (4)	Code Name Matt	Microvega
3 (7)	Chess	Amsoft
4 (8)	Rolland in the Cave	Amsoft
5 (5)	Star Copacabana	Terminal
6 (9)	General Massacre	Atari
7 (3)	Monster Chase	romick
8 (6)	Admiral Goli Spay	Terminal
9 (1)	Rolland goes to Mars	Amsoft
10 (1)	Electro Freddy	Amsoft

**BBC**

1 (1)	Elke	(Acornsoft)
2 (2)	Jet Pac	(Ultimate)
3 (4)	Mr Ee	(Micropower)
4 (3)	Paul	(Acornsoft)
5 (7)	Micro Olympics	(Database)
6 (1)	3D Grand Prix	(Software Innovations)
7 (6)	Archer	(Acornsoft)
8 (1)	Eddie Eids New Challenge	(Software Communications)
9 (10)	Exit the Viking	(Mosaic)
10 (8)	Walkley	(Sopex)

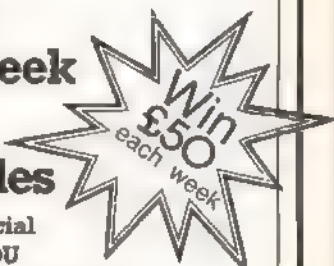
(Figures supplied by W H Smith)



# NEW!

# Readers' Chart

Vote each week for your favourite titles



Each week Popular will compile its own special software top ten chart — compiled by YOU

All you have to do to vote for your current three favourite software titles is fill in the form below (or copy it out on to another sheet if you don't want to damage your magazine) and send it off to: Top 10, Popular Computing Weekly, 12-13 Little Newport Street, London.

To add a bit of spice we will be sending a £50 prize each week to the person who correctly selects that week's top three. If no-one gets it right the £50 will be added to the following week's chart and so on until someone gets it right! (If there is more than one winner that week's prize — whatever the 'pot' stands at — will be split equally between all the correct entries.)

Entries are now being accepted for Week 2. The chart fund stands at £50. Voting for Week 2 closes at 2pm on Wednesday November 28.

Name..... My top 3: Voting Week 2

Address..... 1.....

..... 2.....

..... 3.....

# Diary

Event	Date	Venue	Admission	Organiser
Compu 84	Nov 13-15 10.00am-8.00pm Nov 16 10.00am-4.30pm	Olympia	£1.00	Feed Exhibitions 01 643 8040
6000 Colour Show for Dragon and Tandy Dots	Nov 17-18 10.00am-6.00pm	Royal Horticultural Halls London SW1	£2.00 adults £1.00 children	Computer Marketplace 01 530 1618
Christmas 25 Microdisk	Nov 17 10.00am-6.00pm Nov 18 10.00am-5.00pm	Alexandra Palace London N22	£1.50 adults £1.00 children	Miles Johnson 01 481 9172
Remembrance Computer Fair	Nov 18 11.30am-3.30pm	Winter Gardens Cleethorpes	5p (accompanied children 25p)	Gumley Computer Club 0472 894047
Computer Auction	Nov 28 6.00pm	Royston Hotel Southampton Row London WC2	Free	Crickler Computer Auctions 01 367 8636
Electron and BBC Micro User Show	Dec 6-9	New Horticultural Halls London SW1	£2.00 adults £2.00 children	Database Publications 061 456 9383

## RUNE FOR MORE

Sometime last year, around a month or so before *Valhalla* was finally issued, Dorcas issued a program called *Oracles Cave* which featured an animated man who walked around, climbed ropes, fought baddies and hunted for treasures, in some ways the first animated graphics adventure.



Dorcas has now released a sequel to *Oracles Cave* entitled *The Runes of Zendos* which features the same general layout and a similar, although smaller, character.

The plot is complex and has been deliberately designed to function on different levels on one is a bash it out dungeons and dragons variant, on another it has a text adventure in which amongst other things you try to discover the meaning of various secret runes.

Here's the plot. The year has been trapped — the spirit of

each month is hidden in 12 Runic Hour Glasses which are scattered deep within a magical castle. You must find each glass and attempt to decipher the runes around it.

Top half on the screen shows the action — the little man who walks, runs, fights and climbs. The bottom is for you to input your sentence and for other information. There are a lot of options within the game including saving to microdrive. The glasses form 12 connected, but separately playable, adventures, and you can switch to other adventures at any time during any game.

Graphically it's fair, but not to be compared with the likes of *Tir Na Nog*, nevertheless it's tremendously playable and should take ages to solve completely.

**Program** *The Runes of Zendos*  
**Price** £19.95  
**Micro** Spectrum  
**Supplier** Dorcas  
3 The Oasis  
Glenfield  
Leicester

## NOT STUPID

*Castle Blackstar* is the latest release from CDS Micro Systems and is, unusually for the company, an adventure. Plotwise, what we have portrayed here is a woman as powerful (and beautiful) force of good rather than woman as helpless (but beautiful) captive in the hands of evil.

Lady Artemis is a goodie;

## CDS Micro Systems

### CASTLE BLACKSTAR



she has hair like spun silver, is tall and willowy, and she has lost her power orb. Guess what you have to do.

First impressions of this adventure are good, it has a pleasing BBC like character set and has been very thoughtfully planned. The mark of a clever adventure is when it responds to incorrect inputs (ie, wrong guesses) intelligently. For example, when stuck in the woods I first tried jumping, to which it said 'after jumping up and down for a while you are forced, breathlessly, to stop', then I tried to climb a tree, basically I was told not to bother. Such things for addictiveness make; such a relief — it didn't say 'you jump'.

If you want a quality text adventure that won't irritate you with stupid responses, you'll enjoy this.

**Program** *Castle Blackstar*  
**Price** £5.95  
**Micro** Spectrum  
**Supplier** CDS Micro Systems  
Silver House  
Silver Street  
Doncaster  
South Yorkshire

## HACKABLE

Software Projects have, in *Lode Runner*, provided a game which is designed to be hackable. You are positively encouraged to redesign layouts, baddies and just about everything in *Lode Runner*. Without redesign what you get is a pretty unexciting version of *Apple Panic*; run along platforms, climb ladders, collect blobs.

However, it's easy to design your own screen layouts of platforms and ladders, placing baddies and goodies wherever you want. Thus rather like all those *Manic Miner* redesigners, you can make the thing as easy or difficult as you want.

**Program** *Lode Runner*  
**Price** £9.95  
**Micro** Spectrum  
**Supplier** Software Projects  
Boat Brand Complex  
Allerton Road  
Woolton  
Liverpool



## This Week

<b>Maths Plus</b>	Ed	Commodore 64	£5.95	Sossoft
<b>Science</b>	Ed	Commodore 64	£6.95	Sossoft
<b>Time Trucker</b>	Ed	Commodore 64	£7.95	ASK
<b>World Geography</b>	Ed	Commodore 64	£7.95	Superior Soft
<b>Arcadia</b>	Arc	Dragon 32	£5.50	Beau-Jolly
<b>Number Painter</b>	Ed	Electron	£8.95	ASK
<b>Frogger</b>	Arc	Jupiter Ace	£4.95	Mountsoft
<b>Moneybags</b>	Arc	Jupiter Ace	£4.95	Mountsoft

<b>Number Painter</b>	Ed	MSX	£8.95	ASK
<b>Q1. Lisp</b>	Ur	QL	£59.95	Melacomco
<b>Knight Lore</b>	Arc	Spectrum	£9.95	Ultimate
<b>Battlecars</b>	S	Spectrum	£7.95	Games Workshop
<b>D Day</b>	S	Spectrum	£7.95	Games Workshop
<b>Run for Gold</b>	S	Spectrum	£9.95	Hill McGibbon
<b>Yacht Race</b>	S	Spectrum	£9.95	Hill McGibbon
<b>Backpackers Guide to the Universe</b>	Arc	Spectrum	£7.50	Fantasy



## PSI — LOW

It would be a shame if *Psi Warrior* the new offering from Beyond was completely overshadowed by the imminent release of *Doomdark's Revenge*, even though they are for different machines.

You are the very nicely animated *Psi Warrior*, gliding along the various colourful areas of the Home Sio, with a mission to do battle with and destroy The Source, who is seriously considering the reduction of the Human Race to mindless hulks. (Someone should have told him *Coronation Street* has done it already, twice a week for the last 20-odd years).

Descending though the Sio you must trap PSI and Id creatures before they get you, and increase your own mental powers at their expense. Then you can teleport, levitate, become invisible and remote-view your way to victory.

Looks like it could be worth a try... plus there's the now obligatory competition.

**Program** *Psi Warrior*  
**Price** £9.95 (cassette)  
£11.95 (disc)  
**Micro** CBM 64  
**Supplier** Beyond  
Lecter Court  
153 Farringdon Road,  
London EC1

## RUNNING IN

*Run For Gold* by Hill MacGibbon really is an excellent program, featuring some truly

excellent graphics. It's way beyond the usual left, right pummeling featured in *Hyper Olympics* and the rest. Here the real flavour of training and moving up through the ranks is apparent — running as tactics rather than keyboard bashing.

A large nicely animated sprite seen from behind is your runner; other runners are computer controlled. You need to control speed and movement, and left and right. All my early attempts resulted in me crashing across the tracks and smashing into another runner.

It isn't a matter of running as fast as possible all the time either, energy is finite and if you push too hard at the begin-



ning you'll have nothing left for the finish. And there are results boards, world record attempts, even occasional news flashes to spur you onto greater heights of competitive frenzy.

**Program** *Run for Gold*  
**Price** £9.95  
**Micro** Spectrum  
**Supplier** Hill MacGibbon  
93 Fleet Street  
London EC4Y 1DH

## Pick of the week

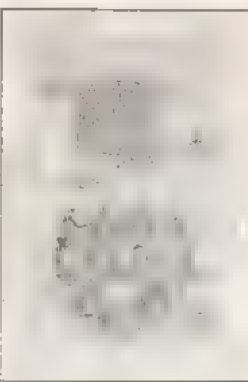
*Knight Lore* is quite simply the most technically awesome game Ultimate have ever released, graphically it makes everything else (except maybe *Tir Na Nog*) look neandathal.

What you get is a *Zaxxon* like, edge on view of the action, as a cartoonish Sabreman character moves around the rooms of a mysterious castle. Beyond this I can only speculate about the plot since *Ultimate* in its usual tradition gives nothing away on the box whatsoever. All I know is that your objective is to stop yourself from turning into a werewolf by finding a potion...

The graphics are masterpieces of design — *Ultimate* must be employing as many graphic designers as programmers these days. There are no colour resolution problems by the simple expediency (like *Tir Na Nog*) of making everything two-colour — I think it actually adds to the atmosphere.

Some rooms contain baddies of one sort or another to be avoided and most contain some sort of puzzle about how to get to the exit — a bit like *Manic Miner* in 3-D but with a greater freedom about how they are solved; eg, in one room it's a matter of getting some tables from a previous room and using them to jump high over an obstacle. In other rooms innocent-looking platforms dissolve to reveal traps beneath — elsewhere secret alcoves containing treasures

## CARTOONESQUE



may be discovered.

*Ultimate* have termed this a 'do whatever you want with whatever you can find' option, filmation and it would seem to allow for much greater freedom of action, making the game that much more enjoyable.

I would stick my neck out and say that this must be one of the five best Spectrum games ever if it wasn't for the fact that some *Ultimate* games, whilst initially amazing have proved almost unplayable — *Lunar Jetman* being a case in point. I suspect that *Knight Lore* is going to prove very addictive indeed, though.

**Program** *Knight Lore*  
**Price** £9.95  
**Micro** Spectrum  
**Supplier** Ashby Computers and Graphics  
The Green  
Ashby de la Zouch  
Leicestershire LE65 8JU

# This Week

**Program** *Forest at World End*  
**Er/Ber** Arc  
**Number Painter** Ed  
**Airlift** Arc  
**Jack and Beanstalk** Arc  
**Overdrive** Arc  
**Smash and Grab** Arc  
**Space Pilot** Arc

**Type** Amstrad  
**Micro** Amstrad  
**Price** £8.95  
**Supplier** Superior Soft  
**Price** £5.95  
**Micro** Microbyte  
**Supplier** ASK  
**Price** £7.95  
**Micro** Superior Soft  
**Supplier** Superior Soft  
**Price** £7.95  
**Micro** Superior Soft  
**Supplier** Superior Soft  
**Price** £7.95  
**Micro** Superior Soft  
**Supplier** Superior Soft

**Star Warp** Arc  
**Zany Kong Junior** Arc  
**Mi Whz** Arc  
**Raid over Moscow** Arc  
**Smuggler** Arc  
**U.K. Geography** Arc  
**Astronomy** Ed  
**French** Ed  
**Geography** Ed

**Price** £7.95  
**Micro** Superior Soft  
**Supplier** Superior Soft  
**Price** £7.95  
**Micro** Superior Soft  
**Supplier** Superior Soft  
**Price** £7.95  
**Micro** Superior Soft  
**Supplier** Superior Soft  
**Price** £7.95  
**Micro** Superior Soft  
**Supplier** Superior Soft  
**Price** £7.95  
**Micro** Superior Soft  
**Supplier** Superior Soft  
**Price** £7.95  
**Micro** Superior Soft  
**Supplier** Superior Soft

## HE SLIMED ME!

Who you gonna call? *Ghostbusters!* you may not have seen the film yet, perhaps you ignored the hit record but you shouldn't miss the program of the film of the record. *Ghostbusters* is not only a pretty good game, it has what must be the best music ever heard on a computer game. Using the Commodore Sid chip and a mere three channels, Activision have produced music that captures the record well enough to have the entire office and indeed all of Sunshine Towers bopping around the room.

Not only do you get music, but using some very nifty digital techniques you also get speech. As the music plays, press the spacebar and you get a very clear and slightly hysterical shout of **GHOSTBUSTERS!**

The game is more than an

arcade shoot-em-up, more like a strategy game mixed with a shoot-em-up. The idea is to make money by trapping ghosts making haunted houses suitable for ordinary American families. The first thing is to buy and equip your wagon - you need blasters and traps, and as you earn more money so you'll be able to buy bigger and better equipment.

Next stage is a map of the city which shows where ghosts are to be found. After driving along the road, you come to the house itself where the ghost must be trapped and blasted. The graphics are all consistently excellent and the game retains the interest - but the music!

**Program** *Ghostbusters*  
**Price** £9.95  
**Micro** *Commodore 64*  
**Supplier** *Activision*  
*15 Harley House*  
*Marylebone Road*  
*Regent Park*  
*London NW1 5HE*



ment works logically - ie, it takes longer over rocky hills than smooth flats.

Things go really badly you get to use nuclear weapons, though this costs you a penalty of one political point. That's all? The game is extremely sophisticated; factors like political opinion and morale are important considerations. There is also a choice of scenarios, one of which has NATO attacking first - surely we British would never do such a thing?

You may be one of those people who finds that the whole idea of European conflict is so frightening and disgusting it is not a proper subject for a computer game. If not, it is at least cleverly programmed.

**Program** *Nato Commander*  
**Price** £9.95  
**Micro** *Commodore 64*  
**Supplier** *US Gold*  
*Unit 10*  
*The Parkway*  
*Industrial Centre*  
*Heneage Street*  
*Birmingham B7 4LY*

## ILLUMINATION

Games Workshop has released its first programs and, not surprisingly, all are loosely in the Strategy/Adventure mould rather than blam blams arcade response games. *Tower of Despair* is an epic adventure divided into two 48K Quilled adventures. Sometimes the Quill can be used lazily, but here thoughtful touches such as illuminated letters (illuminated as in monks rather than lights) and redesigned character sets ensure there is no sense of visual déjà vu.

Rather like the Salamander Dan Diamond series, the program comes with an illustrated booklet that also contains clues to the game as well as a couple of maps. The adventure itself looks pretty difficult.



**Program** *Tower of Despair*  
**Price** £7.95  
**Micro** *Spectrum*  
**Supplier** *Games Workshop*  
*27/29 Sunbeam Road*  
*London NW10 6JP*

## FAMILY FUN?

Now here's the simulation to end all simulations for paranoids everywhere. In *Nato Commander* you get to defend the free world from unprovoked Communist aggression. Experience tension on your East German borders! Fun for all the family!

Unlike many strategy games this one keeps the commands down to a minimum, mostly it's a matter of using cursors and a couple of keys to move units around, get status reports, etc. The large scale map of units includes relevant details such as terrain, rivers, etc; move-



**ASK**, Applied Systems Knowledge, London House, Upper Richmond Road, London SW15 2RP, 01 874 6046 **Beau-Jolly**, Beau-Jolly, 19A New Broadway, Ealing, London W5 5AW, 01 567 9710 **Fantasy**, Fantasy Software, 27A St Georges Road, Cheltenham, Glos GL50 BDT, 0242 512231 **Games Workshop**, Games Workshop, 27/29 Sunbeam Road, London NW10 6JP, 01 985 3713 **Hill McGibbon**, Hill McGibbon, 92 Fleet Street, London EC4Y 1DH, 01 353 6482 **Interceptor**, Interceptor Micro's, London House, The Green, Tadley, Hampshire, 07356 71145 **Metacomco**, Metacomco, 26 Portland Square, Bristol, BS2 8RZ, 0272 428781 **Microbyte**, Microbyte Software, 18 Hilgrove Road, Newquay Cornwall TR7 2QZ, 06373 6886 **Mountsoft**, Mountsoft Computing, 91 Killingworth Dr, High Barnes, Sunderland SR4 8QS, **Scisoft**, Scisoft, 5 Minister Gardens, Newthorpe

Eastwood, Nottingham NG16 2AT, 0773 764501 **Superior Soft**, Superior Software, Regent House, Skinner Lane, Leeds LS7 1AX, 0532 459453 **US Gold**, US Gold, Unit 10, The Parkway Ind Centre, Heneage Street, Birmingham B7 4LY, 021 359 3020 **Ultimate**, Ultimate Play the Game, Ashby de la Zouch, Leicester, LE6 5JV, 0530 411485.

**Key:** Ad - adventure Arc - arcade Ed - education  
S - strategy-simulation UI - utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to: This Week, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.





## Inverted snobbery

Most speakers produce nongrammatical utterances (with varying frequency), but even so they are understood by other people. This is not so with computer languages, because if an utterance (say a line of program) is ungrammatical, the meaning of that line will not be understood by the computer. Another term for grammar, more commonly used with computer languages, is 'syntax'.

There is a crucial distinction between 'meaning' and 'grammar' in the case of computer languages, which is not as important for ordinary languages. For ordinary spoken languages, the difference between syntax and semantics can be the key element in much humour: A pun, play on words, or a 'knock, knock' joke depend upon the human ability to extract more than one meaning out of the same utterance.

The study of the meaning of a utterance in ordinary speech, or the meaning of a line of computer program, is termed 'semantics', and the study of any language is the study of both its syntax, and its semantics. Ordinary

spoken languages are often known as 'natural' languages, and with natural languages the rules are often not explicit, as they have to be with computer languages. Natural languages are not planned; they evolve.

I consider that one important reason why so many computer programs are badly written is that the programmer often uses the same approach in writing programs as he does in speaking his native language. Natural language is noted for its ability to fudge, and its lack of precision, which is acceptable in a spoken language, but is poor technique when programming a computer.

The incoherence of many programs, is related — so I believe — to a general malaise in education. The malaise is the fear of precision, the desire to take the easy route — the 'never mind the spelling, feel the emotion' syndrome. As the study of grammar becomes less and less important in teaching English today, tyro programmers are often unaware of the importance of syntax in their own spoken language, let alone in a programming language.

Anthony Burgess notes (in *Language made plain*) that it does not matter if 'gaue' is spelt 'guage', because we all know what is meant. But do we? Burgess' position presupposes an erudition on the part of the reader, which is not shared by the person who cannot spell. Sympathy for the illiterate is inverted snobbery from those who are not illiterate — and is unfair to those who are.

Computers, however, are not fooled. One underestimated benefit which comes from the use of computers is the realization that words are important, and that sometimes rules have a purpose.

Boris Allan

## Electric shock

### Puzzle No 134

David was looking decidedly pale and shaken in the office this morning.

"Just had the electric bill," he replied in answer to my questioning. "They reckon it comes to several thousand pounds!"

"There must be either a fault in the system or a mistake has been made somewhere," I tried to reassure him.

"It's odd," continued David, "but I took the reading immediately after the meter reader had left and yet their reading comes to 78,217 units more than mine."

He showed me the two readings and as I studied them some spark of understanding stirred. "Where is your meter?" I asked.

"Oh," he replied "under the stairs — right at the back of a load of old junk. In fact, the man from the electric company had to lie full length on an old table with his head dangling over the end, to read the wretched thing."

"Ah," I exclaimed, with a flourish worthy of Sherlock Holmes. "You see, what he did was to read the five-digits upside down. For example, 68801 would read as 10889."

Can you work out what the reading on the five-figure meter was?

### Solution to Puzzle No 129

A = 66 B = 83

From the clues, we know that both A and B are in the range 38 to 99, as they have four-digit squares (Clues 1 down and 4 down). Also, B is the larger and exceeds A by at least 10 (Clue 5 down). By assigning values to A and B in the program, we can check if the relevant digits match in the grid.

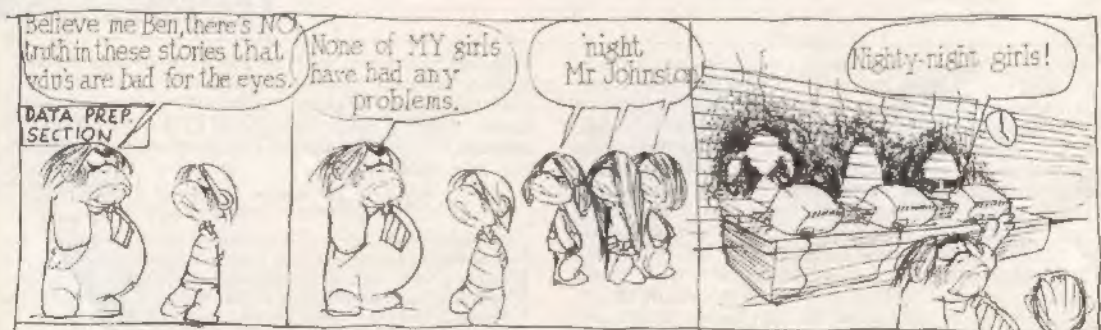
When comparing the position of digits within a string, the program assumes that the first character of the string is reserved for the positive/negative sign.

```
10 FOR A = 32 TO 92 FOR B = 49 TO 96 30 LET AS = STR$(A) 40 LET BS = STR$(B) 50 IF MID$(AS,3,1) <> MID$(BS,2,1) THEN GOTO 170 60 LET QS = STR$(A + B) 70 IF MID$(QS,4,1) <> MID$(PS,5,1) THEN GOTO 170 80 LET RS = STR$(A * B) 90 IF MID$(RS,3,1) <> MID$(PS,4,1) THEN GOTO 170 100 LET S6 = STR$(A * A) 110 IF MID$(S6,4,1) <> MID$(RS,2,1) THEN GOTO 170 120 LET T5 = STR$(A + B) * 9 130 IF MID$(T5,4,1) <> MID$(RS,3,1) OR MID$(T5,8,1) <> MID$(QS,2,1) THEN GOTO 170 140 LET U5 = STR$(B - A) 150 IF MID$(U5,2,1) <> MID$(RS,4,1) THEN GOTO 170 160 PRINT "A="A "B="B 170 NEXT B 180 NEXT A
```

### Winner of Puzzle No 129

The winner is H Briers of Bingham Road, Sherwood, Nottingham, who receives £10.

## The Hackers





# Wally A Merry Christmas



## Christmas Twin Pack with Christmas Card

Spectrum 48K Pyjamarama Automania £11.95

Commodore 64 Pyjamarama Automania £12.95

Amstrad CPC 464 Pyjamarama Master Chess £12.95

# MIKRO-GEN

44 The Broadway, Bracknell, Berks. 0344 427317



